Permit Fact Sheet

General Information

Permit Number	WI-0020184-11-0
Permittee Name and Address	Grafton Water & Wastewater Utility 860 Badger Cir, Grafton, WI 53024
Permitted Facility Name and Address	Grafton Water & Wastewater Utility 1900 9th Ave, Grafton WI 53024
Permit Term	April 01, 2026 to March 31, 2031
Discharge Location	The west bank of the Milwaukee River (South), approximately 750 feet south of the Falls Road bridge. (Lat: 43.30695°N Long: -87.95329°W)
Receiving Water	Milwaukee River in Milwaukee River South Watershed of Milwaukee River Basin in Ozaukee County
Stream Flow ($Q_{7,10}$)	24 cfs
Stream Classification	Warm water sport fish community; non-public water supply
Discharge Type	Existing
Annual Average Design Flow (MGD)	2.5 MGD
Industrial or Commercial Contributors	PACE Industries
Plant Classification	Advanced WWTF: A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Grafton Water & Wastewater Utility owns and operates a 2.5 MGD wastewater treatment facility that serves a population of approximately 12,000 residents in the Village of Grafton and one categorial industrial user (PACE Industries). The facility is a single stage activated sludge wastewater treatment facility that provides preliminary treatment through a fine screen and vortex grit removal. Effluent from the grit removal equipment flows through a mag meter and is then pumped to a primary splitter box, where coagulant is added for phosphorus removal. Flow is split between two primary clarifiers, then flows to two compact treatment plants. Each compact plant has one internal and one external final clarifier. Coagulant is added to the mixed liquor for phosphorus removal. The effluent from the four final clarifiers is combined and disinfected with ultraviolet light. Primary sludge and waste activated sludge are treated using anaerobic digestion, thickened with a gravity belt thickener, then stored both onsite and offsite before land application by a permitted contractor.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on March 10, 2025, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Curtis Nickels on March 10, 2025.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	Flow 1.4 MGD; BOD_5 205 mg/L; TSS 255 mg/L (All January 2021 through May 2025)	INFLUENT: The 24-hour proportional composite sampler is located in the control room of the headworks building. Samples are collected after the fine screen but before the grit removal equipment. Influent flow is measured with a mag meter located immediately upstream of the influent lift pumps and downstream of the grit removal equipment.
107		Collect the mercury field blank using standard sample handling procedures.
001	BOD 7.1 mg/L, TSS 5 mg/L, pH 7.2 s.u., DO 9.4 mg/L, ammonia nitrogen 0.103 mg/L, E.coli 8.48 #/100 mL and phosphorus 0.315 mg/L (All January 2021 through May 2025)	EFFLUENT: 24-hr flow proportional composite sampler located immediately prior to UV disinfection process. Grab samples taken after aeration and UV disinfection.
601		In-stream Sampling Point 601: Representative water samples shall be collected from the Milwaukee River. Sample Point 601 is located downstream of the Grafton Water & Wastewater Utility outfall, at the County Highway T Bridge (43.29477N, -87.94385W). Sample point 601 correlates with the sample location described in the approved AM Plan No. AM-2026-01 (January 29, 2026).
002	152 dry US tons generated annually (per 2025 permit application)	Anaerobically digested, gravity belt thickened, Class B, liquid sludge. Representative samples shall be taken from the sludge hauler truck fill pipe.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Annual	24-Hr Flow Prop Comp	See Mercury Monitoring section.

1.1.1 Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

BOD-monitoring frequency increased

TSS-monitoring frequency increased

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. BOD and TSS monitoring frequencies were increased to meet the minimum frequencies listed in the guidance. The frequencies were increased to the minimum because Grafton Water and Wastewater Utility has not had any violations in the current permit term and does not have significant industrial contributors.

2 Inplant - Monitoring and Limitations

2.1 Sample Point Number: 107- Mercury Field Blank

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Annual	Blank	See Mercury Monitoring section.

2.1.1 Changes from Previous Permit:

In-plant limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

2.1.2 Explanation of Limits and Monitoring Requirements

Mercury Field Blank- Monitoring is included in the permit pursuant to s. NR 106.145, Wis. Adm. Code. Field blanks must meet the requirements under s. NR 106.145(9) and (10), Wis. Adm. Code. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). Field blanks are required to verify a sample has not been contaminated during collection, transportation or analysis.

3 Surface Water - Monitoring and Limitations

3.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD5, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	November - April
BOD5, Total	Weekly Avg	33 mg/L	5/Week	24-Hr Flow Prop Comp	May - October
BOD5, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	November - January
Suspended Solids, Total	Weekly Avg	12 mg/L	5/Week	24-Hr Flow Prop Comp	February - October
Suspended Solids, Total	Monthly Avg	12 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	261.38 lbs/day	5/Week	Calculated	January
Suspended Solids, Total	Weekly Avg	298.49 lbs/day	5/Week	Calculated	November
Suspended Solids, Total	Weekly Avg	251.78 lbs/day	5/Week	Calculated	December
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	6.0 mg/L	5/Week	Grab	Monitoring year round. Limit effective May - October.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total	Daily Max	20 mg/L	5/Week	24-Hr Flow Prop Comp	November - April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	16 mg/L	5/Week	24-Hr Flow Prop Comp	November - March
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	10 mg/L	5/Week	24-Hr Flow Prop Comp	April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	17 mg/L	5/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	14 mg/L	5/Week	24-Hr Flow Prop Comp	October
Nitrogen, Ammonia (NH3-N) Total	Monthly Ave	10 mg/L	5/Week	24-Hr Flow Prop Comp	November - March
Nitrogen, Ammonia (NH3-N) Total	Monthly Ave	6.3 mg/L	5/Week	24-Hr Flow Prop Comp	April
Nitrogen, Ammonia (NH3-N) Total	Monthly Ave	12 mg/L	5/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH3-N) Total	Monthly Ave	9.0 mg/L	5/Week	24-Hr Flow Prop Comp	October
E. coli	Geometric Mean - Monthly	126 #/100 ml	2/Week	Grab	May-September
E. coli	% Exceedance	10 Percent	2/Week	Calculated	May - September. No more than 10% of E.coli bacteria samples collected in any calendar month may exceed 410 count/100 mL.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring in 2029 only.
Mercury, Total Recoverable		ng/L	Annual	Grab	See Mercury Monitoring section.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule in permit.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule in permit.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total	6-Month Avg	0.5 mg/L	5/Week	24-Hr Flow Prop Comp	This is an Adaptive Management interim limit. See schedules and effluent requirements.
Phosphorus, Total	Monthly Avg	1.0 mg/L	5/Week	24-Hr Flow Prop Comp	
Phosphorus, Total		lbs/day	5/Week	Calculated	Calculate the daily mass discharge of phosphorus in lbs/day on the same days phosphorus sampling occurs
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Wet Testing section in permit.
Chronic WET	Monthly Avg	TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	See Wet Testing section in permit.

3.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

- **BOD**-monitoring frequency increased.
- **TSS**-monitoring frequency increased.
- **Ammonia**-monitoring frequency increased.
- **Fecal coliform-**monitoring removed.
- **Phosphorus-**monitoring frequency increased.
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N)**- Quarterly monitoring is required in specific quarters as outlined in the permit.

3.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated **September 8, 2025**.

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. BOD, TSS, Ammonia and Phosphorus monitoring frequencies were increased to meet the minimum frequencies listed in the guidance. The frequencies were increased to the minimum because Grafton Water and Wastewater Utility has not had any violations in the current permit term and does not have significant industrial contributors.

Expression of Limits- In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly and monthly averages whenever practicable.

TSS-The Milwaukee River Basin TMDL was approved by the EPA on March 9, 2018 and has wasteload allocations (WLAs) for total suspended solids (TSS). Consistent with Section 6.4.1 of the Milwaukee River TMDL Report, in cases where the equivalent TSS concentration limit is < 12 mg/L, the effluent limit will be expressed as a concentration of 12 mg/L monthly average. November, December and January have equivalent weekly average TSS concentration limit greater than 12 mg/L, so the weekly mass TMDL limits for November-January are continued along with the current weekly concentration limit of 45 mg/L. The 45 mg/L limit must be retained to meet antibacksliding requirements in ch. NR 207, Wis. Adm. Code.

E. coli-Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL. Bacteria samples may be collected more frequently than required. The monthly limit for E. coli shall be expressed as a geometric mean. In calculating the geometric mean, a value of 1 is used for any result of 0.

Total Phosphorus – The proposed permit will be Grafton Water and Wastewater Utility's third permit term under new administrative rules for phosphorus discharges that took effect December 1, 2010. Details regarding the administrative rules for phosphorus discharges may be found at: https://dnr.wisconsin.gov/topic/Wastewater/Phosphorus. Phosphorus rules are contained in s. NR 102.06 and ch. NR 217, Subchapter III. A monthly average interim limit of 1 mg/L is effective upon reissuance. An Adaptive Management Interim limit of 0.5 mg/L expressed as a 6-month average (averaging period of May through October and November through April) is effective upon reissuance. The facility has shown ability to meet this Adaptive Management Interim limit.

Phosphorus-The Milwaukee River Basin TMDL is an integrated watershed management planning approach that sets Waste Load Allocations (WLAs) for all permitted point sources and Load Allocations (LAs) for all contributing nonpoint sources to impaired waterbodies as required through Section 303(d) of the Clean Water Act. Calculated monthly average mass-based effluent limits replace the former s. NR 217.13 Wis. Adm. Code limits for phosphorus and are consistent with how the mass-based limits are calculated for other dischargers in the Milwaukee River Basin.

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of total phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Adaptive Management for Total Phosphorus Compliance – Grafton Water and Wastewater Utility requested, and the Department approved a plan to implement a watershed adaptive management approach under s. NR 217.18, Wis. Adm. Code and s. 283.13(7) Wis. Stats. as a means for Grafton Water and Wastewater Utility to achieve compliance with the phosphorus water quality standard in s. NR 102.06, Wis. Adm. Code. The phosphorus limitations and conditions in this permit reflect the approved Adaptive Management (AM) Plan AM-2026-01 (January 29, 2026). The permittee shall design and implement the actions identified in the approved AM Plan No. in accordance with the goals and measures

identified. The goal of the AM plan is to reduce phosphorus loadings within the watershed action area by at a minimum 6000 lbs/yr by the end of this permit term. In addition, annual progress reports are required. See Schedules section for more details. The Department may terminate the AM option based on the reasons enumerated in NR 217.18(3)(e)2, Wis. Adm. Code.

The permit contains an interim adaptive management phosphorus limit of 0.5 mg/L expressed as a six-month seasonal average effective upon reissuance. The averaging periods for the six-month average limit are May through October and November through April. Compliance with the 0.5 mg/L six-month interim limit is evaluated at the end of each six-month period on April 30 and October 31 annually. The 1.0 mg/L monthly average phosphorus limit in effect for the duration of the reissued permit.

Surface water monitoring requirements are included in the proposed permit in support of the goals and measures of the Adaptive Management Plan and are discussed in more detail in following subsections of this fact sheet. Sampling is required on the day(s) each week as outlined in the approved Adaptive Management Plan.

3.2 Sample Point Number: 601- Milwaukee River Downstream

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow River		cfs	Per Occurrence	Measure	Voluntary river flow estimates for each day that in-stream phosphorus monitoring is performed November 1 through April 30 annually.
Flow River		cfs	Monthly	Measure	Provide an estimate of river flow for each day that in-stream phosphorus monitoring is performed May 1 through October 31 annually.
Phosphorus, Total		mg/L	Per Occurrence	Grab	Voluntary monitoring November 1 through April 30 annually. See permit subsections for sampling and reporting requirements.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate and report total monthly phosphorus loads for the months of May through October annually. See permit subsections for calculation of total monthly loads.
Phosphorus, Total		mg/L	Monthly	Grab	Collect samples monthly May 1 through October 31 annually. See permit

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					subsections for sampling and reporting requirements.
Phosphorus, Total		lbs/month	Per Occurrence	Calculated	Calculated total phosphorus loads may also be reported for the months of November through April, as data is available. See permit subsections for calculation of total monthly loads.

3.2.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section. Sampling requirements and frequencies are the same as the previous permit.

3.2.2 Explanation of Limits and Monitoring Requirements

As part of the Adaptive Management Plan requirements, downstream monitoring for river flow rate, in-stream phosphorus concentration and total monthly in-stream phosphorus loads is required during the months of May through October. Monitoring for these same parameters is voluntary during the months of November through April. When voluntary monitoring is completed, results must be reported on the monthly eDMR. The in-stream phosphorus concentration and river flow rate are used to calculate the total monthly loading of phosphorus in the Milwaukee River on a monthly basis. This monitoring will allow the permittee to demonstrate reductions in phosphorus loading for each month of the year.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid				
Does sludge management demonstrate compliance? **Yes**						
Is additional sludge storage required? **No** **Note:** Grafton's municipal sludge is hauled off-site to another permitted facility for land application on approved fields.						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? **No**						
Is a priority pollutant scan required? **No**						

4.1 Sample Point Number: 002- Hauled Sludge

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sample once in 2027

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sample once in 2027
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

4.1.1 Changes from Previous Permit:

Sludge limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

PFAS –Monitoring is required once pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

4.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5) Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k) Wis. Adm. Code.

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine future land application rates and released this risk assessment in January of 2025. The department is evaluating this new information. Until a decision is made, the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS" should be followed.

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department's implementation of EPA's recommendations. To quantitate this risk, PFAS sampling has been included in this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

5 Schedules

5.1 Watershed Adaptive Management Option Annual Report Submittals

The permittee shall submit annual reports on the implementation of AM Plan No. AM-2026-01 (January 29, 2026) as specified in the Phosphorus Limitation(s) and Adaptive Management Requirements permit section and the following schedule.

Required Action	Due Date

Annual Adaptive Management Report #7: Submit an annual adaptive management report. The annual adaptive management report shall: o Identify those actions from Table 9 the approved adaptive management plan that were completed during the previous calendar year and those actions that are in progress; o Evaluate collected monitoring data; o Document progress in achieving the goals and measures identified in the approved adaptive management plan; o Describe the outreach and education efforts that occurred during the past calendar year; o Identify any corrections or adjustments to the adaptive management plan that are needed to achieve compliance with the phosphorus water quality standards specified in s. NR 102.06, Wis. Adm. Code; o Describe any updates needed to Village of Grafton Water and Wastewater Utility approved phosphorus optimization plan; and o Submit results from all sample points outlined in AM plan No. AM-2026-01 (January 29, 2026) to the Department using the Department's Laboratory Data Entry System (LDES)	03/31/2027
Annual Adaptive Management Report #8: Submit an Adaptive Management Report with the required information described in this section (see above).	03/31/2028
Annual Adaptive Management Report #9: Submit an Adaptive Management Report with the required information described in this section (see above).	03/31/2029
Annual Adaptive Management Report #10: Submit an Adaptive Management Report with the required information described in this section (see above).	03/31/2030
Final Adaptive Management Report for 2nd Permit Term: Submit the final Adaptive Management (AM) report documenting progress made during the second permit term under AM in meeting the watershed phosphorus reduction target of 6000 lbs/year, as well as the anticipated future reductions in phosphorus sources and phosphorus effluent concentrations, which shall be measured in accordance with the AM Plan protocols. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. AM-2026-01 (January 29, 2026) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions.	03/31/2031
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM plan No. AM-2026-01 (January 29, 2026) per s. NR 217.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan No. AM-2026-01 (January 29, 2026) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per the "Adaptive Management Reopener Clause" permit section, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area.	01/15/2031

Annual Adaptive Management Report #12: Submit an Adaptive Management Report with the required information described in this section (see above).	03/31/2032
Annual Adaptive Management Report #13: Submit an Adaptive Management Report with the required information described in this section (see above).	03/31/2033
Annual Adaptive Management Report #14: Submit an Adaptive Management Report with the required information described in this section (see above).	03/31/2034
Annual Adaptive Management Report #15: Submit an Adaptive Management Report with the required information described in this section (see above).	03/31/2035
Final Adaptive Management Report: Submit the final Adaptive Management (AM) report documenting progress made throughout the AM project in meeting the watershed phosphorus reduction target of 12000 lbs/yr, and in stream water quality standards specified in s. NR 102.06, Wis. Adm. Code. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. AM-2026-01 (January 29, 2026) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, there should be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions.	03/31/2036

5.1.1 Explanation of Schedule

This compliance schedule requires the permittee to submit annual adaptive management (AM) annual reports that show progress towards meeting the goals and measures contained in the approved AM plan. The final AM Report for this permit term must document the success of meeting the watershed phosphorus minimum reduction target of 6000 lbs/yr. The compliance schedule may be modified at permit reissuance, should changes in AM goals and measures or timing necessitate different dates for schedule items.

A land application schedule in not required since all sludge is hauled by another permitted facility that land applies to their approved fields.

Pursuant to s. NR 217.18(1) Wis. Adm. Code., phosphorus water quality criteria must be achieved “as soon as possible”. The duration for this adaptative management schedule is 10 years. This timeframe is consistent with the approved adaptive management plan, and represents the shortest possible duration based upon the following factors that influence time required for the water body to achieve the phosphorus criterion:

- Magnitude of point and/or nonpoint source phosphorus reductions required
- Costs associated with point and/or nonpoint source phosphorus reductions
- For nonpoint source reductions, the time required to contact landowners and receive adequate participation to implement practices
- Physical characteristics of the watershed and receiving water, including landuse, soil properties, slopes, channel gradient, and level of legacy sediment/phosphorus currently in the system

Attachments

Water Quality Based Effluent Limits for Grafton Water and Wastewater Utility, dated September 8, 2025

Adaptive Management Plan Renewal, dated January 29, 2026

Adaptive Management Plan Conditional Approval Letter, dated January 30, 2026

Justification Of Any Waivers from Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Susan Eichelkraut Wastewater Specialist Date: February 6, 2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 09/08/2025

TO: Susan Eichelkraut – SER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for Grafton Water & Wastewater Utility
WPDES Permit No. WI-0020184-11

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable) for the discharge from Grafton Wastewater Utility in Ozaukee County. This municipal wastewater treatment facility (WWTF) discharges to the Milwaukee River, located in the Milwaukee River Watershed in the Milwaukee River Basin. This discharge is included in the Milwaukee River Basin (MRB) Total Maximum Daily Load (TMDL) as approved by EPA on 03/09/2018.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD_5						1
November – April			45 mg/L	30 mg/L		
May – October			33 mg/L	30 mg/L		
TSS						1,2
November – January			45 mg/L	12 mg/L		
			TMDL			
February – October			12 mg/L	12 mg/L		
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen						1,3
May – October		6.0 mg/L				
Ammonia Nitrogen						1
Nov. – March	20 mg/L		16 mg/L	10 mg/L		
April	20 mg/L		10 mg/L	6.3 mg/L		
May – September			17 mg/L	12 mg/L		
October			14 mg/L	9.0 mg/L		
Bacteria						1,4
E. coli				126 #/100 mL geometric mean		
Chloride						5
Mercury						1,6
PFOS and PFOA						7
Phosphorus						8,9
AM Interim Limits				1.0 mg/L	0.5 mg/L	
Final				TMDL		
TKN, Nitrite+Nitrate, and Total Nitrogen						10
Acute WET						11,12
Chronic WET				2.6 TUc		11,12

Footnotes:

1. No changes from the current permit.
2. Additional TSS mass limitations are required in accordance with the waste load allocations specified in the Milwaukee River Basin TMDL, shown below:

Month	Weekly Ave TSS Effluent Limit (lbs/day)
Jan	261.38
Nov	298.49
Dec	251.78

3. Monitoring only November – April.
4. Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. Monitoring only at a frequency to ensure that 11 samples are available at the next permit issuance.
6. Monitoring only.
7. PFOS and PFOA monitoring is recommended at a frequency of once every two months in accordance with s. NR 106.98(2), Wis. Adm. Code.
8. The phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Milwaukee River Basin to address phosphorus water quality impairments within the TMDL area, and shown below:

Month	Monthly Ave Limit (lbs/day)
January	2.94
February	3.41
March	2.81
April	2.95
May	3.11
June	3.22
July	2.80
August	2.71
September	2.88
October	2.33
November	2.95
December	2.66

9. Under the phosphorus Adaptive Management (AM) Plan, the interim limits (and technology-based limit (TBL)) of 1.0 mg/L, monthly average and 0.5 mg/L, six-month average should be effective upon permit reissuance.
10. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all municipal major permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).
11. Annual acute and chronic WET testing is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 39%. According to the *State of Wisconsin Aquatic Life*

Toxicity Testing Methods Manual (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from the Milwaukee River.

12. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. Testing should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (4) – Narrative, Map, 2008 Ammonia Limits Calculations and Thermal Table

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Attachment #1

Water Quality-Based Effluent Limitations for
Grafton Water & Wastewater Utility

WPDES Permit No. WI-0020184

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Grafton Water & Wastewater Utility serves a population of approximately 11,400. The facility is a single-stage activated sludge wastewater treatment facility (WWTF) which underwent improvements in 2004 and led to an increase in the plant's design flow. Preliminary treatment is achieved through mechanical bar screens, an aerated grit chamber, and addition of ferric chloride to the aerated grit chamber for phosphorus removal. Wastewater is then pumped to two primary clarifiers followed by fine bubble aeration and four final clarifiers. Two clarifiers are located within the compact plants and two are separate. Effluent is disinfected through an ultraviolet disinfection system.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations

The current permit, expiring on 12/31/2025, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD_5						1,2
November – April			45 mg/L	30 mg/L		
May – October			33 mg/L	30 mg/L		
TSS						1,3
November – January			45 mg/L	12 mg/L		
			TMDL			
February – October			12 mg/L	12 mg/L		
Ammonia Nitrogen						
Nov. – March	20 mg/L		16 mg/L	10 mg/L		
April	20 mg/L		10 mg/L	6.3 mg/L		
May – September			17 mg/L	12 mg/L		
October			14 mg/L	9.0 mg/L		
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen						1,2,4
May – October		6.0 mg/L				
Bacteria						5
E. coli				126 #/100 mL geometric mean		
Mercury						6
Phosphorus						7
AM Interim Limits				1.0 mg/L	0.6 mg/L	
Final				TMDL		

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
TKN, Nitrite+Nitrate, and Total Nitrogen						6
Acute WET						8
Chronic WET				2.6 TUc		8

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. Additional TSS mass limitations are required in accordance with the waste load allocations specified in the Milwaukee River Basin TMDL, shown below:

Month	**Weekly Ave TSS Effluent Limit (lbs/day)**
Jan	261.38
Nov	298.49
Dec	251.78

4. Monitoring only for November – April.
5. Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. Monitoring only.
7. The final TMDL limits are shown in the table below:

Month	**Monthly Ave Limit (lbs/day)**
January	2.94
February	3.41
March	2.81
April	2.95
May	3.11
June	3.22
July	2.80
August	2.71
September	2.88
October	2.33
November	2.95
December	2.66

8. Annual acute and chronic WET testing is required in the current permit. The IWC for chronic WET was 39%

Receiving Water Information

- Name: Milwaukee River
- Waterbody Identification Code (WBIC): 15000
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply and recreational use. Note: Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS for Station MI11, where Outfall 001 is located.
  7-Q_{10} = 24 cubic feet per second (cfs)
  7-Q_2 = 52 cfs
  90-Q_2 = 44.2 cfs (85% of 7-Q_2)
  Harmonic Mean Flow = 107 cfs using a drainage area of 476 mi^2

  The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
- Hardness = 321 mg/L as $CaCO_3$. This value represents the geometric mean of data from 04/27/2021 – 02/06/2024 from chronic WET testing.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%. A mixing zone is not allowed for discharges of bioaccumulating compounds of concern (BCCs) in the Great Lakes system as described in s. NR 106.06(2)(br), Wis. Adm. Code.
- Source of background concentration data: Metals data from the Milwaukee River at Hwy CTH C (Station ID #463098) and chloride data from the Milwaukee River at Hwy 33 (Station ID #10032506) are used in this evaluation. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: There are several other dischargers to the Milwaukee River; however, they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The Milwaukee River at the point of discharge is 303(d) listed as impaired for total phosphorus and PCBs.

Effluent Information

- Design flow rates:
  Annual average = 2.5 million gallons per day (MGD)
  Peak daily = 8.5 MGD
  Peak weekly = 5.75 MGD
  Peak monthly = 3.5 MGD

  For reference, the actual average flow from 01/01/2021 – 05/31/2025 was 1.4 MGD.
- Hardness = 330 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected in March and April 2024 which were reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with one industrial contributor – PACE Industries.
- Water supply: Municipality waterworks and private wells.
- Additives: Grafton has included 3 additives in the permit application that have the potential to be present in Outfall 001. These additives are listed below:
  - Kemira Water Solutions – Kemira Pix-201: Phosphorus removal

- Aqua Chem of America – Aqua Chem 1395: Thicken WAS sludge
- Aqua Chem of America – Aqua Chem 1795: Thicken digester sludge
- An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. This is the case upon initial review of the listed additives. Therefore, an additive review is not needed at this time.

- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the "priority pollutants" except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The permit-required monitoring for mercury from April 2021 to January 2025 and chloride from January to March 2021 is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Copper Effluent Data

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
03/17/2025	5.3	03/31/2025	11	04/13/2025	9.8
03/20/2025	5.4	04/03/2025	7.9	04/17/2025	20
03/24/2025	5.9	04/07/2025	9.5	04/27/2025	5.7
03/27/2025	9.7	04/10/2025	9.4		
1-day P_{99} = 22.9 µg/L					
4-day P_{99} = 15.0 µg/L					

Chloride Effluent Data

Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)
01/24/2021	482	02/21/2021	506	02/24/2025	480
01/25/2021	475	02/22/2021	501	03/17/2025	510
01/26/2021	460	02/23/2021	558	03/20/2025	490
01/27/2021	492	02/24/2021	601	04/27/2025	410
1-day P_{99} = 618 mg/L					
4-day P_{99} = 555 mg/L					

Mercury Effluent Data

Sample Date	Mercury (ng/L)	Sample Date	Mercury (ng/L)	Sample Date	Mercury (ng/L)
11/23/2010	0.21	09/01/2015	0.72	04/29/2021	0.46
10/13/2011	0.70	02/10/2016	0.67	05/09/2022	2.20
10/23/2012	1.40	08/17/2017	0.59	05/10/2023	0.50
11/05/2013	1.30	06/05/2018	0.74	03/25/2024	0.68
11/05/2014	1.00	02/19/2019	0.50	01/22/2025	0.67
03/04/2015	0.84	02/04/2020	1.00		
1-day P_{99} = 2.42 ng/L					
4-day P_{99} = 1.51 ng/L					
30-day P_{99} = 1.05 ng/L					

The following table presents the average concentrations and loadings at Outfall 001 from 01/01/2021 – 05/31/2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameters with Effluent Limits

	Average Measurement	Average Mass Discharged
BOD_5	7.1 mg/L	
TSS	5.0 mg/L	55.9 lbs/day
pH field	7.2 s.u.	
Dissolved Oxygen	9.4 mg/L	
Ammonia Nitrogen	0.103 mg/L*	
E. coli	8.48 #/100 mL**	
Phosphorus	0.315 mg/L*	3.49 lbs/day

*Results below the limit of detection (LOD) were included as zeroes in calculation of average.
** The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the geometric mean.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10}) if the 1-day Q_{10} flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q_{10}).

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and
Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Grafton, and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
RECEIVING WATER FLOW = 19.2 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340	13.0	680	136	<1.1		
Cadmium	330	40.5	1.04	81.1	16.2	<0.17		
Chromium	301	4446	4.04	8892	1778	<1.5		
Copper	330	47.9	9.87	95.7			23	20
Lead	330	339	9.97	678	136	<5.4		
Mercury (ng/L)		830		830			2.42	2.20
Nickel	268	1080	6.71	2161	432	8.3		
Zinc	330	342	30.2	684	137	22		
Chloride (mg/L)		757	83.5	1514			618	601

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.
* * The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)
RECEIVING WATER FLOW = 6.0 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		152	13.0	368	73.6	<1.1	
Cadmium	175	3.82	1.04	8.13	1.63	<0.17	
Chromium	301	326	4.04	825	165	<1.5	
Copper	321	28.1	9.87	56.3			15
Lead	321	86.4	9.97	205	41.0	<5.4	
Mercury (ng/L)		440		440			1.51
Nickel	268	120	6.71	296	59.2	8.3	
Zinc	321	334	30.2	805	161	22	

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SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chloride (mg/L)		395	83.5	878			555

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 11 cfs (¼ of the 90-Q_{10}), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Mercury (ng/L)	1.3		1.3			1.05

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 26.8 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370	1.04	2929	586	<0.17	
Chromium (+3)	3818000	4.04	30297451	6059490	<1.5	
Lead	140	9.97	1042	208	<5.4	
Mercury (ng/L)	1.5		1.5			1.05
Nickel	43000	6.71	341177	68235	8.3	

The limit for this substance is based on a secondary value. Acute limits are set equal to the secondary value rather than two times or using the 1-Q_{10} s. NR 106.06(3)(b)2 and s. NR 105.05(2)(f)6), Wis. Adm Code.

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 26.8 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	13.0	15.4	3.08	<1.1

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not required for toxic parameters in this section. Limits and/or monitoring recommendations are made in the paragraphs below:

Chloride – Considering available effluent data from the current permit term (01/24/2021 – 04/27/2025), the 1-day P_{99} chloride concentration is 618 mg/L, and the 4-day P_{99} of effluent data is 555 mg/L.

These effluent concentrations are below the calculated WQBELs for chloride, therefore **no effluent limits are needed. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance** to meet the data requirements of s. NR 106.85, Wis. Adm. Code.

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

The current permit requires annual monitoring of the influent and effluent for total recoverable mercury. A total of 17 effluent sampling results are available from 11/23/2010 – 01/22/2025 for total recoverable mercury. The average concentration was 0.83 ng/L, and the maximum was 2.2 ng/L. Because the 30-day P_{99} of available data (1.05 ng/L) is less than the most stringent WQBEL of 1.3 ng/L, **no WQBEL for mercury is required for permit reissuance. A minimum of annual mercury monitoring is recommended to continue in the permit reissuance** to determine reasonable potential at the next issuance.

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Available monitoring sample data from the Grafton Waterworks (PWS ID: 24601115) is provided in the table below:

Water Supply PFAS Data

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
02/28/2023	CB01931-03	BG653	ND	ND
02/28/2023	CB01931-01	WJ284	0.3	ND
02/28/2023	CB01931-09	FM494	ND	ND
02/28/2023	CB01931-07	BG655	1.3	ND
02/28/2023	CB01931-05	BG654	0.35	ND
09/28/2023	WB06259-01	BG651	1.1	0.8
06/12/2024	CC06532-02	BG651	1.1	1.2
		Average =	0.59	0.29

The limited data above shows the municipal water supply is below 1/5th of the applicable PFOS and PFOA criteria. However, based on the effluent flow rate and the type of indirect discharger contributing to the collection system, **PFOS and PFOA monitoring is recommended at a once every two months frequency.**

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has daily maximum, weekly average and monthly average limits. These limits are re-evaluated at this time due to the following changes:

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.

- The maximum expected effluent pH has changed

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation:

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - pH)})] + [B \div (1 + 10^{(pH - 7.204)})]$$

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1379 sample results were reported from 01/02/2021 – 05/30/2025. The maximum reported value was 8.0 s.u. (Standard pH Units). The effluent pH was 7.8 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.75 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.73 s.u. Therefore, a value of 7.75 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.75 s.u. into the equation above yields an ATC = 13 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method
In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the the 1-Q_{10} receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	26.5
1-Q_{10}	78.8

The 2×ATC method yields the most stringent limits for Grafton.

This limit is greater than the current daily maximum limit of 20 mg/L during April - November. If Grafton would like to request an increase to the existing permit limits an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limits must be continued in the reissued permit. The Department would be unable to increase the limit due to the lack of need as shown via the antidegradation rule (ch. NR 207, Wis. Adm. Code) because the highest reported concentration was 11.4 mg/L during the previous permit term. **No changes are recommended in any of the permit limits for ammonia.**

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)

The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in Attachment #3.

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 01/03/2021 – 05/19/2025.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	Nov. – March	April	May – September	October
1-day P_{99}	1.09	0.37	2.72	5.39
4-day P_{99}	0.60	0.18	1.74	3.36
30-day P_{99}	0.25	0.08	0.80	1.51
Mean*	0.06	0.04	0.16	0.30
Std	0.54	0.11	1.50	3.24
Sample size	397	85	366	86
Range	<0.032 - 3.49	<0.032 - 0.484	<0.032 - 11.38	<0.032 - 11.38

*Values lower than the limit of detection were substituted with a zero

Reasonable Potential

The need to include ammonia limits in Grafton's permit is determined by calculating 99th upper percentile (or P_{99}) values for ammonia and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. However, since the permit currently has daily, weekly, and monthly average limits year-round, **the limits must be retained regardless of reasonable potential**, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

> (b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Conclusions and Recommendations

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. These are equivalent to the limits in the current permit. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
Nov. – March	20	16	10
April	20	10	6.3
May – September		17	12
October		14	9.0

PART 4 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of total phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Grafton currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

Milwaukee River Basin TMDL
The TMDL report addresses phosphorus water quality impairments within the Milwaukee River Basin and provides waste load allocations (WLAs) required to meet water quality standards. The TMDL-based limits should be expressed in a manner consistent with the wasteload allocation and assumptions of the TMDL.

The monthly average total phosphorus (TP) effluent limits in lbs/day are calculated based on the maximum monthly phosphorus WLA given in pounds per month as suggested in the TMDL report and implementation guidance. The monthly maximum TP WLAs for this facility are found in Appendix A of the Milwaukee River Basin TMDL report. **These were calculated at the last reissuance and do not change:**

Total Phosphorus Wasteload Allocations and Effluent Limits

Month	Monthly Average TP Effluent Limit (lbs/day)
Jan	**2.94**
Feb	**3.41**
Mar	**2.81**
Apr	**2.95**
May	**3.11**
Jun	**3.22**
Jul	**2.80**
Aug	**2.71**
Sep	**2.88**
Oct	**2.33**
Nov	**2.95**
Dec	**2.66**

Effluent Data
The following table summarizes effluent total phosphorus monitoring data from 01/03/2021 – 05/28/2025.

Total Phosphorus Effluent Data

	Concentration mg/L	Mass lbs/day
1-day P_{99}	0.845	11.1
4-day P_{99}	0.558	6.79

Attachment #1

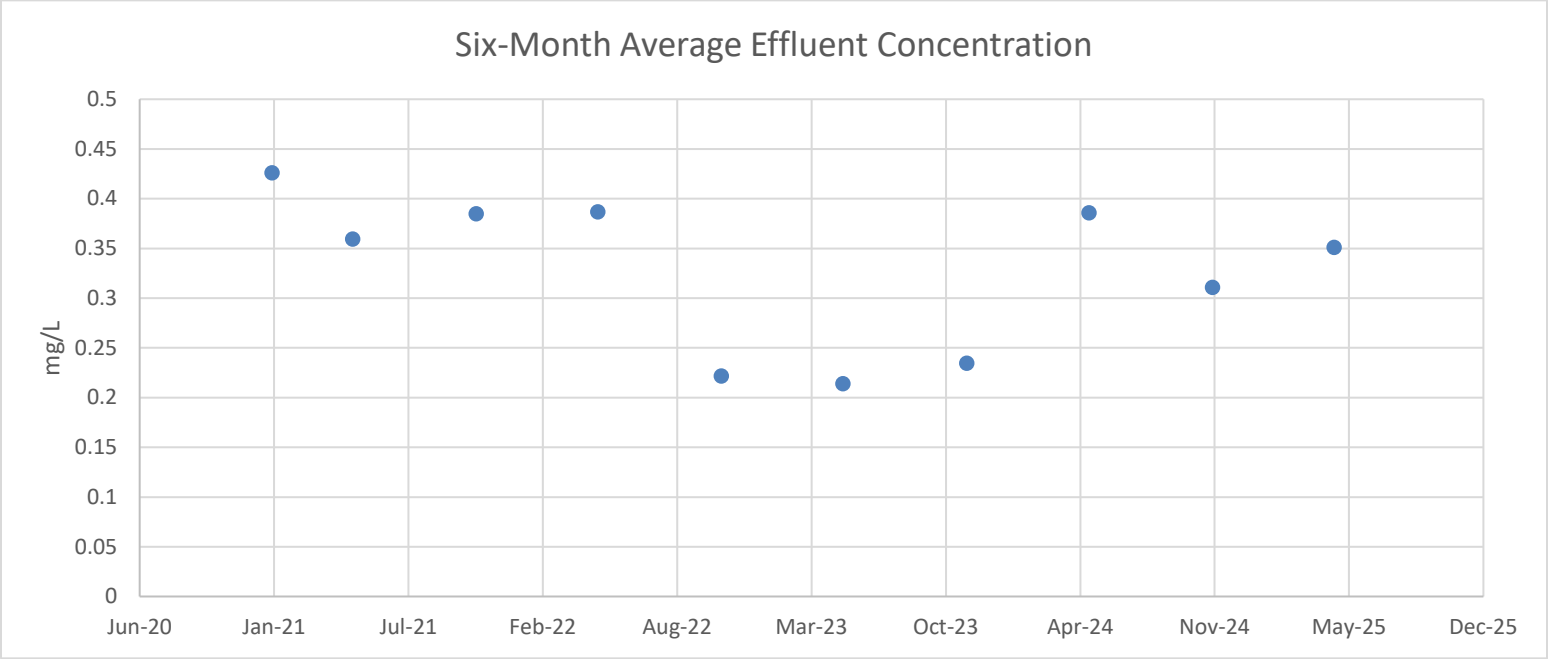
	Concentration mg/L	Mass lbs/day
30-day P_{99}	0.393	4.63
Mean*	0.315	3.64
Std	0.157	2.12
Sample size	920	887
Range	<0.082 - 1.32	0.52 - 16.89

*Results below the limit of detection (LOD) were included as zeroes in calculation of average.

Adaptive Management Interim Limit

Grafton has re-applied for adaptive management (AM) for a second term to comply with the TMDL-based limits. Since this is the second permit term in which AM is being pursued, **the recommended interim limit is 0.5 mg/L, expressed as a 6-month average and 1.0 mg/L as a monthly average per s. NR 217.18(3)(e)3, Wis. Adm. Code.**

The monthly average limit of 1.0 mg/L is already effective in the current permit. Grafton has also been meeting the six-month average limit of 0.6 mg/L which is required for first term AM permits under s. NR 217.18(3)(e), Wis. Adm. Code. Shown below are the six-month average phosphorus mass data from the current permit term which shows that **Grafton can currently meet 0.5 mg/L as a six-month average limit.** Therefore, **no compliance schedule is recommended in the reissued permit to meet the interim AM limits.**



PART 5 – TOTAL SUSPENDED SOLIDS

The Milwaukee River Basin TMDL also has wasteload allocations (WLAs) for total suspended solids (TSS). For a municipal facility, the limits for TSS must be expressed as weekly and monthly averages.

The current permit includes the TSS limits shown below:

Current TSS Limits

Month	Weekly Ave Concentration (mg/L)	Monthly Ave Concentration (mg/L)	Weekly Ave Mass (lbs/day)
Jan	45	12	261.38
Feb	12	12	-
Mar	12	12	-
Apr	12	12	-
May	12	12	-
Jun	12	12	-
Jul	12	12	-
Aug	12	12	-
Sep	12	12	-
Oct	12	12	-
Nov	45	12	298.49
Dec	45	12	251.78

The monthly TMDL WLAs according to the TMDL report are shown in the table below.

Monthly WLAs

Month	Monthly Maximum TSS WLA[1] (lbs/month)
Jan	6,232.90
Feb	4,902.45
Mar	4,286.15
Apr	3,595.77
May	4,581.68
Jun	4,249.25
Jul	3,197.47
Aug	2,882.97
Sep	3,980.78
Oct	4,304.68
Nov	6,888.24
Dec	6,003.95

Footnotes:

1. Monthly maximum TSS WLAs are provided in Appendix A (Table A.19) in the Milwaukee River Basin TMDL.

These WLAs were translated into weekly and monthly average limits using a multiplication factor as recommended in Sections 5.4 and 5.5 in the Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001). A coefficient of variation (CV) was calculated, based on TSS mass monitoring data, to be 0.6. This was calculated by dividing the standard deviation of the TSS mass data

by the average of the TSS mass data. The CV used in the previous evaluation was 0.5.

Using a higher CV in this evaluation and the same monitoring frequency (4x/week) will result in a higher multiplication factor to calculate weekly and monthly average limits. Because Grafton can meet the current TMDL-based TSS limits, **no changes to TSS limits are recommended in the reissued permit.**

The effluent data from the current permit term is shown below:

Total Suspended Solids Effluent Data

	Concentration mg/L	Mass lbs/day
1-day P_{99}	12.1	166
4-day P_{99}	8.06	103
30-day P_{99}	5.98	70.8
Mean	4.980	55.9
Std	2.18	31.8
Sample size	920	888
Range	1.2 – 20.2	3.1 – 325

The current limits are shown below which are recommended to continue in the reissued permit:

TSS Limits

Month	Weekly Ave Limit (lbs/day)	Weekly Ave Limit (mg/L)	Monthly Ave Limit (mg/L)
Jan	261.38	45	12
Feb	-	12	12
Mar	-	12	12
Apr	-	12	12
May	-	12	12
Jun	-	12	12
Jul	-	12	12
Aug	-	12	12
Sep	-	12	12
Oct	-	12	12
Nov	298.49	45	12
Dec	251.78	45	12

For additional information, consistent with Section 6.4.1 of the Milwaukee River TMDL Report, in cases where the equivalent TSS concentration limit is $\leq$ 12 mg/L, the effluent limit will be expressed as a concentration of 12 mg/L monthly average. This is why only November, December, and January have weekly average mass limits. The weekly average concentration for these months is continued to be 45 mg/L.

Attachment #1

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from 01/01/2021 – 05/31/2025.

The table below summarizes the maximum temperatures reported during monitoring from 01/01/2019 – 02/28/2021.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	52	53	81	120
FEB	50	52	81	112
MAR	51	56	72	120
APR	54	55	63	105
MAY	58	61	78	113
JUN	65	67	91	105
JUL	70	71	109	114
AUG	72	72	107	110
SEP	70	71	97	109
OCT	65	68	91	120
NOV	61	63	70	120
DEC	55	56	80	120

Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  (a) The highest recorded representative daily maximum effluent temperature

(b) The projected 99th percentile of all representative daily maximum effluent temperatures

- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Based on the available effluent data no effluent limits are recommended for temperature. The complete thermal table used for the limit calculation is in Attachment #4. **Monitoring is not recommended to continue in the reissued permit** because there is not concern for the effluent to exceed the calculated limits.

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document* (2022).

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The **IWC of 39%**, shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$IWC\ (as\ \%) = Q_e \div \{(1 - f)\ Q_e + Q_s\} \times 100$$

Where:

Q_e = annual average flow = 2.5 MGD = 3.87 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 24 cfs ÷ 4 = 6 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in

chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Pass or Fail?	Use in RP?	
04/11/2006					>100	>100	Pass	Yes	
11/09/2006	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
01/23/2007					>100	>100	Pass	Yes	
09/22/2009	>100	>100	Pass	No	>100	>100	Pass	No	1
06/22/2010	>100	>100	Pass	No	>100	>100	Pass	No	1
03/03/2011	>100	>100	Pass	No	>100	>100	Pass	No	1
12/04/2012	>100	>100	Pass	Yes	81	>100	Pass	Yes	
06/25/2013	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
09/24/2013	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
11/11/2014	>100	>100	Pass	Yes	39.4	>100	Pass	Yes	
09/20/2016	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
05/16/2017	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
02/13/2018	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
10/15/2019	>100	>100	Pass	Yes	91.6	>100	Pass	Yes	
10/27/2020	>100	>100	Pass	Yes	87.6	>100	Pass	Yes	
04/27/2021	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
11/01/2022	>100	>100	Pass	Yes	65.9	>100	Pass	Yes	
08/15/2023	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
02/06/2024	>100	>100	Pass	Yes	>100	>100	Pass	Yes	

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

Acute Reasonable Potential = [(TUa effluent) (B)(AMZ)]

Chronic Reasonable Potential = [(TUc effluent) (B)(IWC)]

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

Chronic Reasonable Potential = [(TU_c effluent) (B)(IWC)]

Chronic WET Limit Parameters

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/39.4 = TU_c]	2.3 Based on 5 detects	39%

[(TUc effluent) (B)(IWC)] = 2.28 > 1.0

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from 04/11/2006 – 02/06/2024.

Expression of WET limits

Chronic WET limit = [100/IWC] TU_c = 2.6 TU_c expressed as a monthly average

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

WET Checklist Summary

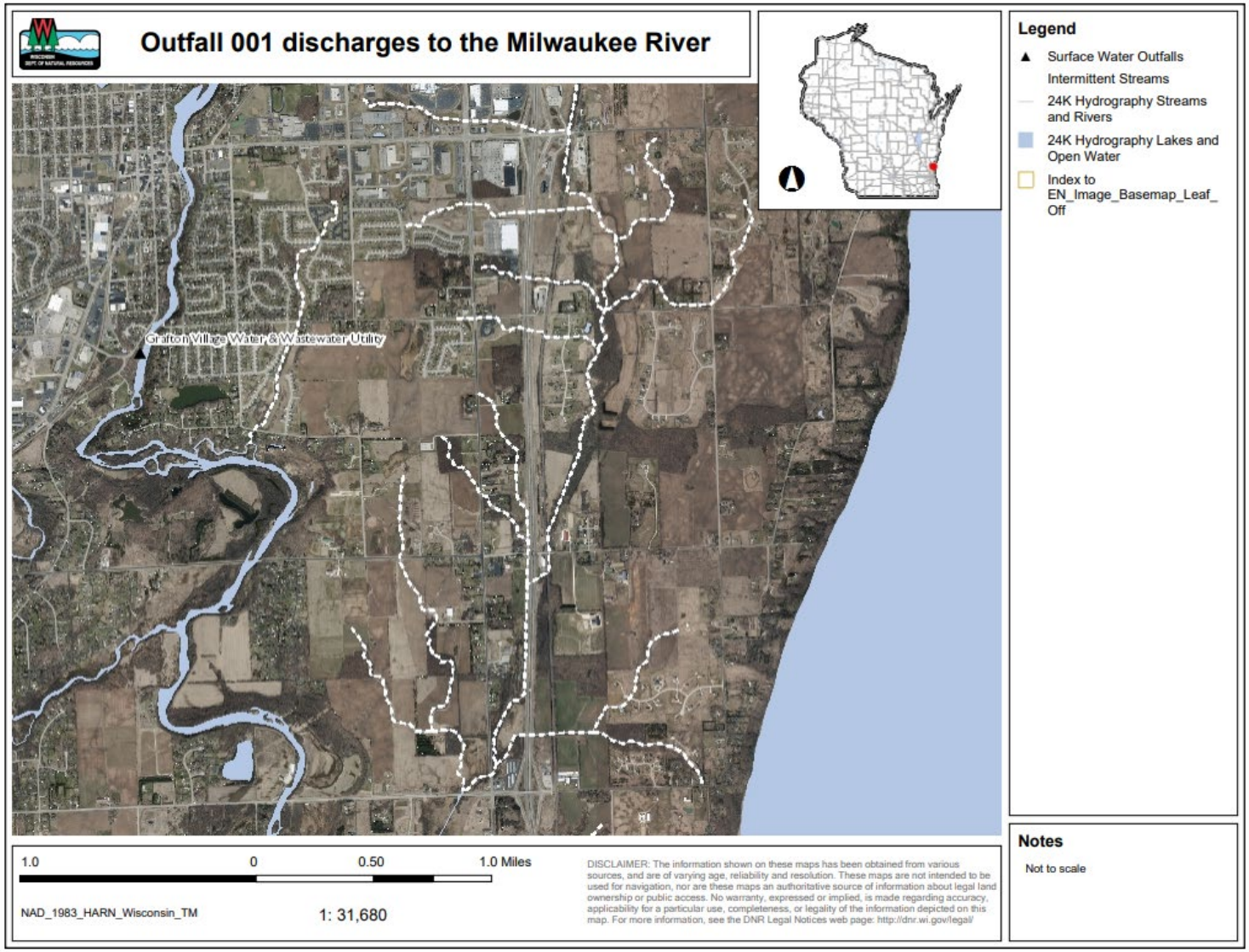
	Acute	**Chronic**
AMZ/IWC	Not Applicable. **0 Points**	IWC = 39%. **10 Points**
Historical Data	14 tests used to calculate RP. No tests failed. **0 Points**	16 tests used to calculate RP. No tests failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**

Attachment #1

	Acute	Chronic
Receiving Water Classification	WWSF **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	No reasonable potential for limits for any substances based on ATC; Ammonia nitrogen limit carried over from the current permit. Copper, mercury, nickel, zinc, chloride, detected. Additional Compounds of Concern: Chloroform **5 Points**	No reasonable potential for limits for any substances based on CTC; Ammonia nitrogen limit carried over from the current permit. Copper, mercury, nickel, zinc, chloride, detected. Additional Compounds of Concern: Chloroform **5 Points**
Additives	3 Water Quality Conditioners added. Permittee has proper P chemical SOPs in place. **3 Points**	All additives used more than once per 4 days. **3 Points**
Discharge Category	1 Industrial Contributor. **5 Points**	Same as Acute. **5 Points**
Wastewater Treatment	Secondary or Better **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**18 Points**	**28 Points**
Recommended Monitoring Frequency (from Checklist):	1x yearly	1x yearly
Limit Required?	No	Yes Limit = 2.6 TU_c
TRE Recommended? (from Checklist)	No	No

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, annual acute and chronic WET tests are recommended in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge. Testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 2.6 TUc as a monthly average in the effluent limits table of the permit.
- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
- A minimum of annual acute and chronic monitoring is recommended because Grafton is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.

Attachment #2



Attachment #3

Ammonia Calculations from 2008

Overview of Ammonia Rule Changes: The changes to ch. NR 105 establish acute (daily) and chronic (weekly and monthly) criteria for ammonia in-stream, based on updated information on ammonia toxicity. Acute criteria are dependent on the classification of the receiving water and on the pH of the discharge. Chronic criteria are dependent on the classification, temperature and pH of the receiving water. In addition, the chronic criteria for most classifications of receiving water are dependent on the presence or absence of early life stages of fish. For fish species other than burbot, the presence of early life stages in assumed in April and when the average temperature is equal to or greater than 14.6 degrees Celsius. Burbot are known to reproduce in colder water beginning in January of the year. There have been a large number of surveys in the Southeastern Wisconsin river basins over the years, and no burbot have been found (communication with Sue Beyler, SER Fisheries Biologist). In addition, the Department's Master Fish file and Becker's Fishes of Wisconsin have no record of burbot in the Milwaukee River basin. Therefore, the criteria will not be determined to protect the early life stages of burbot.

The changes to ch. NR 106 establish procedures for determining effluent limitations. For acute (daily maximum) limits, the limit equals twice the acute criterion established in conformance with ch. NR 105, unless a zone of initial dilution has been approved for a discharger. The acute limit is dependent on the maximum effluent pH, which in this case is represented by the 99th percentile of 7.9 s.u. (based on effluent data from 1/1999 through 8/2008).

Section NR 106.32(3)(c)1. specifies that for weekly average (4-day chronic) limits, the limit is a mass balance based on the average annual design flow of the plant and the average minimum 7-day flow that occurs once every ten years (7-Q_{10}). For monthly average (30-day chronic) limits, the limit is a mass balance based on the average annual design flow of the plant and the average minimum 30-day flow that occurs once in five years (30Q5) or 85% of the average minimum 7-day flow that occurs once every two years (7Q2). Per s, NR 106.32(3)(c)3. and 4.(also in s. NR 106.06(4)(c)3. and 4.), the percentage of stream flow used is related to the temperature of the stream, unless the permittee has made a demonstration of a zone of free passage or rapid dilution, so that the mixing zone is minimized. In the case of a zero-flow stream, however, the percentage of dilution is not relevant.

Receiving Water Temperature:
May – September = 23 degrees C
April and October = 9 degrees C.
November – March = 3 degrees C.
(based on default temperature data for small streams in Wisconsin)

Background Ammonia Levels:
April = 0.04 mg/L
May – September = 0.03 mg/l
October = 0.05 mg/l
November – March = 0.11 mg/l
(based on ambient ammonia concentrations for the Milwaukee River Basin)

River pH (based on stream default pH data):
May – September = 8.21 s.u.
Other months = 7.97 s.u.

Based on the limit determination procedures in ch. NR 106 and the information given above, the calculated ammonia limits are:

Calculated Ammonia Limits for Grafton (in mg/l)			
Month(s)	**Daily Maximum**	**Weekly Average**	**Monthly Average**
April	20.3	10.5	6.3
May – September	20.3	17.1	11.6
October	20.3	15.0	9.0
November – March	20.3	17.0	10.0

Ch. NR 207 and other conditions in NR 106: The weekly average limits given above represent an increase from limits in the current permit for Grafton because of the change in criterion and because of the increase in plant design flow. In accordance with s. NR 106.34 and with s. NR 207.03, any increases in weekly effluent limitations for ammonia are not subject to the provisions in ch. NR 207 due to the change in criteria, but the increases in the weekly average limits attributable to the design flow change would be subject to the provisions of NR 207. Since this is the initial proposal for daily and monthly ammonia limits, these limits are exempt from ch. NR 207.

The current permit includes mass as well as concentration limitations for ammonia. An increase in calculated mass that is solely due to change in the criterion can be determined by the calculation of weekly concentrations and masses based on the former design flow of 2.15 MGD. In the table below, these are the results under the heading 'Old Flow (2.15 MGD)'. The results under the heading 'New Flow (2.5 MGD) are the concentrations determined for the new design flow and using the updated criteria, along with calculated masses. Under the Header 'NR 207' the 1/3 mass increase represents the mass of the discharge using the old design flow plus one third of the additional assimilative capacity, in accordance with the definition of 'No significant lowering of Water Quality' in NR 207. "NSLOWQ Limits' are a back calculation from the 1/3 mass increase. Since the Grafton plant is capable of meeting the 'NSLOWQ Limits', these limits will apply.

Grafton Weekly Ammonia Limits - Antidegradation Review						
Old flow (2.15 MGD)			**New Flow (2.5 MGD)**		**NR 207**	
Month(s)	Conc (mg/l)	Mass (lbs/day)	Conc (mg/l)	Mass (lbs/day)	1/3 Mass Increase (lbs/day)	NSLOWQ Limits (mg/l)
May – September	19.45	348.76	17.06	355.70	351.07	16.84
Oct	16.46	295.14	14.98	312.33	300.87	14.43
November – March	18.63	334.05	16.96	353.62	340.58	16.33
April	11.52	206.57	10.48	218.51	210.55	10.10

Section NR 106.33(2) indicates that effluent limitations greater than or equal to 20 mg/l will not apply to treatment works subject to the requirements of ch. NR 210 for the months of May through October; therefore, the calculated daily maximum limits would not apply for these months.

Here is a summary of recommended limitations for ammonia (rounded to two significant figures):

Attachment #3

Recommended Ammonia Limits for Grafton (in mg/l)			
Month(s)	**Daily Maximum**	**Weekly Average**	**Monthly Average**
April	20	10	6.3
May – September	No Limit	17	12
October	No Limit	14	9
November – March	20	16	10

In accordance with ch. NR 106.32(5)(b), no mass limitations are recommended.

Attachment #4

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Grafton Wastewater Utility		**7-Q_{10}:**	24	cfs		
Outfall(s):	001		**Dilution:**	25%		**Start:** 01/01/19	01/01/21
Date Prepared:	8/7/2025		**f:**	0		**End:** 02/28/21	05/31/25
Design Flow (Qe):	2.50	MGD	**Stream type:**	Small warm water sport or forage fish con			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	1.6	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	24	1.959	2.233	0	52	53	81	120
FEB	34	50	76	24	2.003	4.553	0	50	52	81	112
MAR	38	52	77	24	2.700	3.391	0	51	56	72	120
APR	48	55	79	24	3.195	4.546	0	54	55	63	105
MAY	58	65	82	24	2.068	2.995	0	58	61	78	113
JUN	66	76	84	24	2.573	3.301	0	65	67	91	105
JUL	69	81	85	24	1.672	2.151	0	70	71	109	114
AUG	67	81	84	24	2.106	2.584	0	72	72	107	110
SEP	60	73	82	24	2.098	3.116	0	70	71	97	109
OCT	50	61	80	24	1.445	1.830	0	65	68	91	120
NOV	40	49	77	24	1.638	2.137	0	61	63	70	120
DEC	35	49	76	24	1.741	2.350	0	55	56	80	120

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
1027 W St Paul Ave
Milwaukee, WI 53233

Tony Evers, Governor
Karen Hyun, Ph.D., Secretary
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Toll Free 1-888-936-7463
TTY Access via relay - 711

January 30, 2026

Jon Butt, Mead & Hunt
Grafton WWTP
1900 9th Ave
Grafton, WI 53024

SUBJECT: Village of Grafton (WPDES Permit No. WI-0020184)
Adaptive Management Plan - Conditional Approval

Dear Mr. Butt,

The Wisconsin Department of Natural Resources (WDNR) has received the final draft of the Adaptive Management (AM) Plan. The plan was last submitted on January 29, 2026, and included updates that were requested on January 13, 2026, and January 23, 2026. The WDNR has reviewed the AM plan and has no additional comments at this time.

Based on the WDNR's review, the AM Plan is in general conformance with the WDNR Adaptive Management Guidance and requirements contained in s. NR 217.18, Wis. Adm. Code. The plan indicates that the Village will utilize AM to comply with the effluent limitations for total phosphorus for their discharge from the Village of Grafton Wastewater Treatment Plant, Outfall 001, to the Milwaukee River. Actions outlined in the AM plan involve nonpoint phosphorus reductions within Milwaukee River Basin TMDL River Reaches MI-16 and MI-17. For continued AM eligibility, phosphorus reductions undertaken by the Village and its partners are expected to maintain the existing offset of 6,000 lbs/yr to the Milwaukee River within the second permit term. This value is found in section 2.4.2 of the January 29, 2026, AM plan and is equal to the estimated mass reduction achieved through calendar year 2025, which marked the end of the first AM permit term for the Village.

The WDNR conditionally approves the AM Plan as a basis for phosphorus compliance during the next WPDES permit term. The WDNR has assigned the AM plan a tracking number of AM-2026-01 and will be referenced as such in the draft WPDES permit. The draft permit will contain an interim limit for phosphorus and reporting requirements consistent with s. NR 217.18, Wis. Adm. Code. The AM plan will be included as part of the public notice package for permit reissuance, and final approval is subject to public comment and EPA review.

The WDNR appreciates the Village's continued interest in watershed-based phosphorus compliance. If you have any questions or comments, please contact me at (414) 897-5723 or nicholas.lent@wisconsin.gov.

Thank you,

Nick Lent

Nick Lent
Wastewater Engineer

cc: Brecken Gries, Village of Grafton
Matt Claucherty, WDNR
Curt Nickels, WDNR
Susan Eichelkraut, WDNR

PREPARED BY

Mead & Hunt

FINAL

Renewal of Adaptive Management Plan for WPDES Permit Reissuance

Village of Grafton, Wisconsin
Final Report Issued June 2025
Report Revised December 2025
Revisions 2 & 3 January 2026
Mead & Hunt Project No. R4666713-222121.01

GRAFTON
QUALITY LIFE, NATURALLY.

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REPORT PREPARED BY

Jon Butt, PE
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6737 W Washington Street, Suite 3500
West Allis, WI 53214

1. Introduction

The Village of Grafton, Wisconsin (Grafton) has spent the last 5 years implementing an Adaptive Management (AM) plan. AM was selected by Grafton to comply with phosphorus requirements found in its Wisconsin Pollution Discharge Elimination System (WPDES). Grafton completed an extensive planning effort that included optimizing phosphorus reductions, studying options for improving the wastewater treatment process, and estimating watershed reductions that could be used to comply with the WPDES permit limits. More recently, Grafton reviewed three compliance alternatives for meeting the total maximum daily load (TMDL)-based phosphorus requirements, electing to continue with AM.

1.1 Background

Grafton operates a WWTP in Ozaukee County. Effluent from the WWTP is discharged to the Milwaukee River in the Milwaukee River (south) watershed of the Milwaukee River basin within TMDL reach MI-17. The effluent is regulated by WPDES Permit No. WI-0020184-09-1.

Grafton has spent the past 5 years implementing an AM plan designed to reduce the concentration of phosphorus in the Milwaukee River to meet the NR 102 water quality criterion. While Grafton has recorded a reduction in the growing season median phosphorus concentration, the current phosphorus concentration remains above the 0.075 mg/L water quality criterion.

1.2 Summary of WQBEL Values

The Milwaukee River TMDL, approved by the United States Environmental Protection Agency (U.S. EPA), contains mass allocations for all point and non-point sources within the watershed. Monthly mass allocations for Grafton were included in its current WPDES permit, expressed as daily average mass values. The following table reflects the daily mass values as recorded in the current WPDES permit.

Table 1 | Mass Allocations for Grafton from the Milwaukee River TMDL

Total Phosphorus	
Month	**Daily Average (lb/day)**
January	2.94
February	3.41
March	2.81
April	2.95
May	3.11
June	3.22
July	2.80
August	2.71
September	2.88
October	2.33
November	2.95
December	2.66

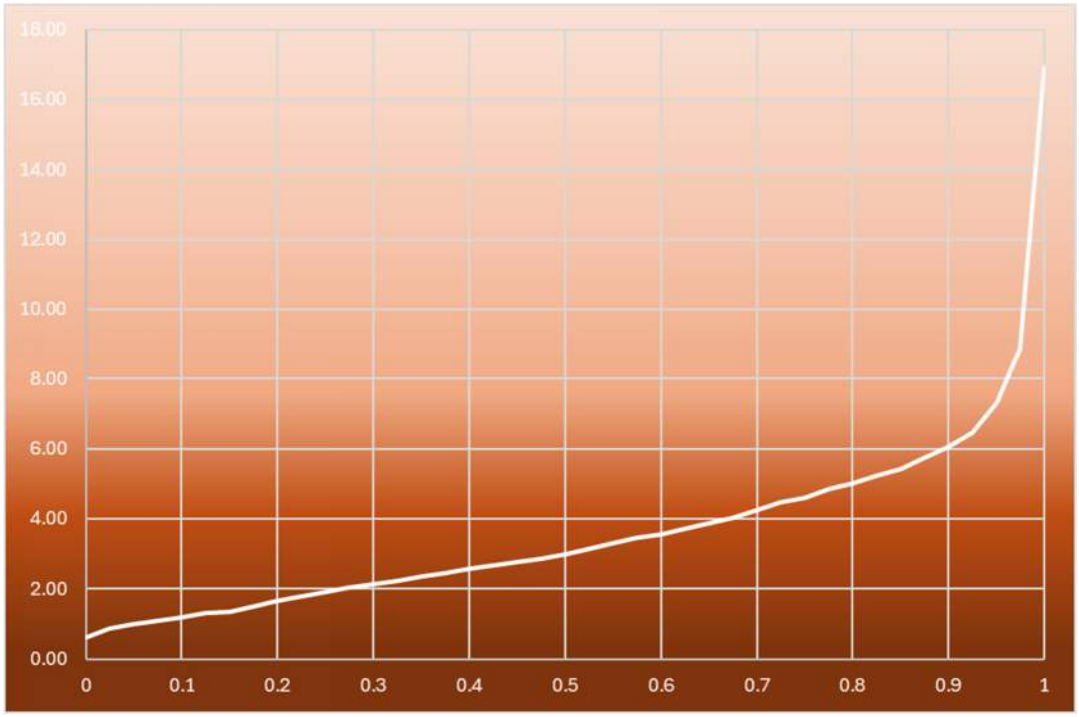
The month with the most restrictive limit is October, with an average of 2.33 lb/day. The months with the least restrictive limits are June and February, with daily averages of 3.22 and 3.41 lb/day, respectively.

1.3 Summary of Effluent Phosphorus

Grafton monitors effluent phosphorus concentration and influent flow in accordance with WPDES permit requirements. Effluent phosphorus concentration, flow, and mass for the existing WWTP operating under current flows and loading conditions have been compiled from February 2022 through December 2024. This data was analyzed in two different ways. The first analysis reviewed the data for compliance with the water quality TMDL values found in Table 1. The data indicates the monthly average daily mass of phosphorus in the WWTP effluent was 3.5 lb/day with a range from 0.61 to 16.91 lb/day. The monthly average mass exceeds all the values found in Table 1.

A cumulative distribution of the effluent mass data was prepared (see Figure 1). This data indicates that under current operating conditions, the existing WWTP is achieving a daily effluent phosphorus mass value of under 3 lb/day, 50% of the time or less, and just over 6 lb/day, 90% of the time or less. The water quality-based effluent limit (WQBEL) requires under 3 lb/day total phosphorus mass for 9 of 12 months. The current plant performance is not sufficient to meet the WQBEL requirements.

Figure 1 | Cumulative Distribution of Total Phosphorus Effluent Mass for Grafton | February 2022 through December 2024



The second analysis of the effluent phosphorus data reviewed the data for compliance with the second permit term interim phosphorus limit of 0.5 mg/L 6-month average. This new interim limit replaces the current 0.6 mg/L 6-month average limit. Calculations were made to determine the 6-month average phosphorus concentration for both the growing season and non-growing season periods. The growing season is defined as May through October, and the non-growing season is November through April. The following table summarizes the 6-month average phosphorus concentration.

Table 2 | Average 6-month Phosphorus Concentration

Total Phosphorus Concentration (mg/L)			
Year	**Growing Season (May-Oct)**	**Non-growing Season (Jan-April + Nov + Dec)**	**Non-growing Season (Nov-April)**
2022	0.384	0.368	
2023	0.210	0.145	0.212*
2024	0.385	0.269	0.231**

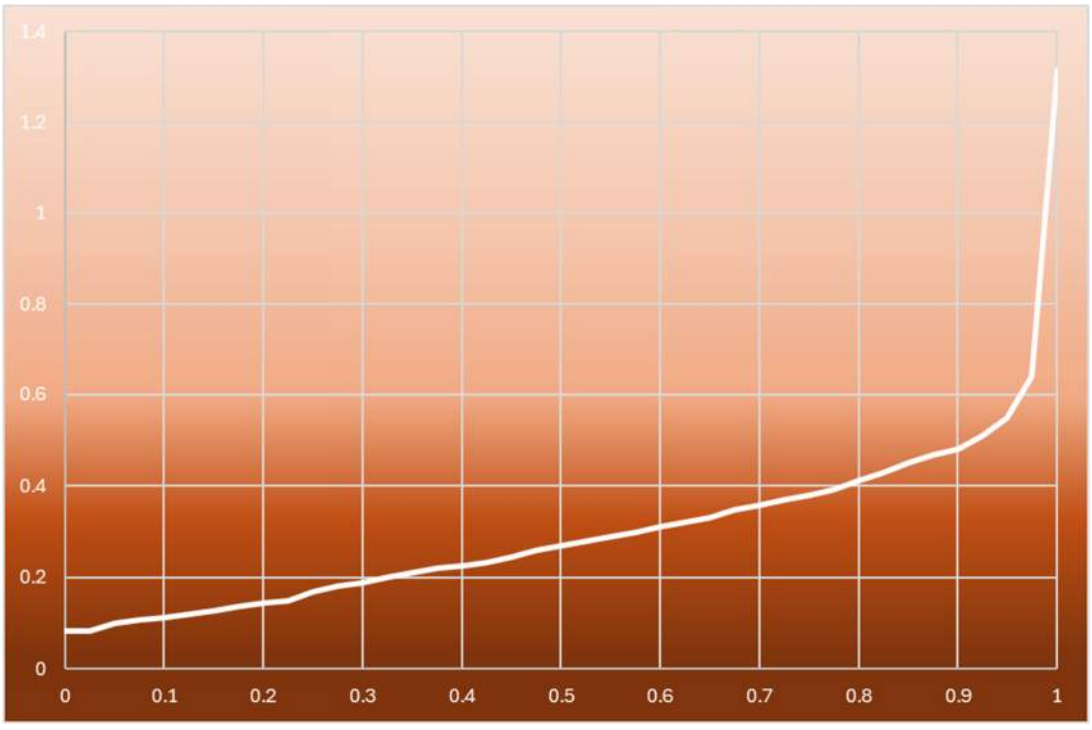
*The value shown starts in November 2022 and runs through April 2023.

**The value shown starts in November 2023 and runs through April 2024.

The values in Table 2 indicate that the effluent phosphorus concentration is always below 0.5 mg/L 6-month average.

A cumulative distribution of the effluent concentration data was prepared (see Figure 2). This data indicates that under current operating conditions, the existing WWTP is achieving a daily effluent phosphorus concentration value of less than 0.3 mg/L, 50% of the time or less, and just under 0.5 mg/L, 90% of the time or less. Compliance with the new interim limit requires that the average effluent phosphorus concentration over a period of 6 months be under 0.5 mg/L. The fact that the current WWTP performance produces an effluent phosphorus concentration below the interim limit 90% of the time suggests that the existing WWTP under existing conditions can meet the interim limit.

Figure 2 | Cumulative Distribution of Total Phosphorus Effluent Concentration for Grafton | February 2022 through December 2024



To summarize, the existing WWTP, while optimized for phosphorus removal, is not able to meet the water quality mass limits identified by the Milwaukee River TMDL. However, it has demonstrated that it can meet an interim limit of 0.5 mg/L total phosphorus 6-month average.

1.4 Summary of the Treatment Process

Grafton uses physical, biological, and chemical processes to treat its incoming raw wastewater flows at its WWTP prior to discharge to the Milwaukee River. The WWTP has an average design flow of 2.50 million gallons per day (MGD).

Raw sewage enters the WWTP headworks building via 24-inch and 30-inch interceptor sewers. Within the headworks building, influent to the WWTP passes through a fine screen and a vortex grit removal process for capturing non-treatable material. Effluent from the grit removal process flows to three influent pumps that transfer wastewater from the headworks building to the primary splitter box. Ferrous chloride is added to the primary splitter box for the removal of influent phosphorus.

Figure 3 | Aerial View of Grafton's WWTP

Wastewater is distributed to primary clarifiers, where large, suspended solids settle, and floating material is skimmed off. Primary effluent from each clarifier recombines and distributes equally once again between two parallel single-stage compact activated sludge plants for biological treatment. Compact WWTPs use fine bubble aeration and selector zones. In the compact sludge plants, a mass of microorganisms feed on the suspended and dissolved organic material contained in the wastewater. This action aerobically stabilizes wastewater and aids in converting ammonia to nitrate.

Ferrous chloride is added to the mixed liquor before being distributed to four final clarifiers. This is a second injection point where coagulant is added to help with phosphorus removal. Two of these clarifiers are contained in the center part of the compact sludge plants. Two units, larger in size, are located downstream from the compact WWTPs. The clarifiers promote the settling of the mixed liquor solids and the skimming of floatable solids. A portion of the mixed liquor settled solids is returned to the compact WWTPs to maintain sufficient populations of biomass, while the remaining settled solids are sent to storage for further processing (wasted activated sludge).

Waste activated sludge is pumped to one of two anaerobic digesters, where it is combined with primary sludge. The anaerobic digesters decompose the biological solids, producing biogas. Anaerobic sludge is periodically removed from the digester and dewatered with a gravity belt thickener and polymers. Thickened or conditioned waste sludge is stored in a tank until it can be land applied on Wisconsin Department of Natural Resources (WDNR)-registered agricultural fields.

Final clarifier effluent receives seasonal ultraviolet disinfection and post-aeration from May through September before being discharged to the Milwaukee River.

The north compact WWTP was built in 1970. The south compact WWTP, along with the two large additional final clarifiers, was built in 1981. A major improvement project was completed in 2005. An anaerobic digester mixing project was completed in 2008, the installation of ultraviolet disinfection was completed in 2011, a new headworks building and equipment were completed in 2021, a new coagulant feed system was completed in 2024, and improvements to the electrical power distribution equipment were also completed in 2024.

1.5 Wastewater Treatment Plant Phosphorus Optimization

Grafton's staff has completed phosphorus optimization activities. Previous reports identified a decreasing influent phosphorus concentration trend. However, this trend has stopped, and influent concentrations have stabilized. While decreasing influent phosphorus would seem desirable, phosphorus is a critical nutrient for the activated sludge treatment process. WWTP staff would need to add phosphorus to the influent flow if the phosphorus concentration were to drop too low. Grafton has no plans to pursue any source reduction opportunities at this time, but may choose to do so if influent concentrations increase.

Grafton completed a project that added a second coagulant addition point to the existing infrastructure. The initial reports indicate that the second point of coagulant addition has stabilized the effluent phosphorus concentration while at the same time allowing the WWTP to decrease the amount of coagulant being used. The long-term average phosphorus concentration is lower than in previous years, as reported earlier in this plan. The existing infrastructure is optimized for phosphorus removal, and any further reductions are not expected unless dramatic and expensive changes to the existing infrastructure are completed.

1.6 Eligibility

Grafton is eligible to continue implementing AM as a compliance alternative because:

- The Milwaukee River phosphorus concentration remains above the criterion of 0.075 mg/L.
- More than 50% of the total phosphorus loading to the Milwaukee River continues to come from non-point sources.
- Optimization of the existing WWTP has not reduced the effluent P mass to meet the allocations from the TMDL for the Milwaukee River. Additional treatment equipment, such as filtration, will be required to reduce the effluent phosphorus concentration to below the WQBEL values from the TMDL.
- Grafton achieved watershed reductions of almost 6,000 lbs/year, which exceeds the 322 lbs/year minimum requirement as indicated in the WPDES permit. Reductions were from agricultural sources and optimization at the WWTP.

2. Nine Key Plan Elements

In accordance with WDNR guidelines, the renewed AM plan for permit reissuance (updated AM plan) is comprised of nine key elements that are summarized in the following sections. The nine key elements include:

1. Identification of partners
2. Watershed description (action area) and load reduction goals
3. Watershed inventory
4. Identify where reductions will occur
5. Describe management measures
6. Estimate load reductions within the permit term
7. Identify how success will be measured
8. Describe financial security
9. Schedule and milestones

2.1 Partners

Grafton plans to continue to pursue phosphorus reduction opportunities within the action area and the Greater Milwaukee River Reach MI-16 to bring the Milwaukee River into compliance with the 0.075 mg/L criterion. Grafton plans to continue working with the following area partners:

- Ozaukee County
- Milwaukee River Watershed Clean Farm Families (MRWCFF)

The involvement of these regional partners has been important to achieving reductions over the past 5 years. Continued involvement from these partners is critical to any future reductions.

2.2 Describe Watershed (Action Area) And Determine Load Reduction Goals

The action area for Grafton's AM plan is defined as the Greater Milwaukee River Reach MI-17, which includes the Grafton WWTP outfall. The action area is defined as the portion of the Milwaukee River from its confluence with Cedar Creek on the southern (downstream) end and Saukville on the northern (upstream) end. MI-17 reach is shown on Figure 4 as the green hashed area. River sampling at the pour point for the action area indicates that the 4-year average median phosphorus concentration is 0.083 mg/L and the upper limit using an 80% confidence interval value is 0.10 mg/L. The annual median phosphorus concentration at the pour point for the action area is shown in Table 3.

Figure 4 | Action Area for Grafton Adaptive Management Plan

Table 3 | Milwaukee River Sample Data at Pour Point
[Median, Count, Confidence Interval, and Upper Confidence Limit Values]

Location	All Data Aug 2020 through Oct 2024	2022, 2023 & 2024 Data Only	2022 thru 2025 Data Only
Median	0.080	0.080	0.083
Count	29	18	24
Confidence Interval (80%)	0.013	0.018	0.017
Upper Confidence Limit (UCL)	0.093	0.098	0.10

The annual median values were calculated from monthly growing season values.

A simple mass balance is used to estimate the target phosphorus reduction for the AM plan. Grafton collected annual average flow information from the United States Geological Survey (USGS) river monitoring stations for the Milwaukee River and for Cedar Creek over the past 15 years. The 15-year average annual river flow through the action area was estimated to be 456.2 cfs (246 MGD). Combining the 15-year annual average flow with an instream concentration reduction of 0.008 mg/L (which represents the difference between the 4-year median value of 0.083 mg/L and the criterion value of 0.075 mg/L) yields an annual reduction target of 5,990 Lb/year lb/year to bring this reach into compliance with the water quality standard for phosphorus.

The median concentration of the Milwaukee River at the beginning of the adaptive management plan in 2020 was about 0.084 mg/L. The median concentration has essentially not changed since the program began. The following table shows the annual median total phosphorus concentration as compared to the acreage enrolled in the program and the modeled P reduction from the acreage.

Table 4 | A comparison of the annual median P values to Ag acreage and modelling

Year	Total P Concentration (mg/L)		Acreage Enrolled (acres)	Modelled P Reduction (lb/yr)
	Into Action Area	At Pour Point		
2020		0.084	0	0
2021	0.079	0.079	717	334
2022	0.091	0.078	1853	1770
2023	0.14	0.073	2167	2,374
2024	0.15	0.133	3,730	3,987
2025	0.137	0.145	3,683	5,001

The trend that is represented in Table 4 suggests that the median concentration of P in the river flowing into the action area increases as the acres of farm fields enrolled in the program increase and as the modelled P reduction also increases. This is an unexpected result and may be caused by a delay in any phosphorus reductions in fields reaching the river. The transport of phosphorus to the river is not well understood. Any water that runs off a field will traverse ditches and other waterways on its way to the river. It is possible that it will take time for the delivery conduits to become void of phosphorus before a response will be measured within the river.

The information in Table 4 indicates that phosphorus flowing into the action area is significant. Reductions in the Greater Milwaukee River nonpoint source area upriver will help reduce the instream phosphorus concentration within the action area.

2.3 Watershed Inventory

Grafton's proportional share of the in-river phosphorus mass is calculated by comparing the current average WWTP phosphorus discharge to the current in-river phosphorus mass, as shown in Table 4.

Table 5 | Grafton Total Phosphorus Discharge as Compared to the Milwaukee River

Phosphorus Source	Mass Calculation	Annual Mass
Village of Grafton WWTP	Average daily discharge: 3.5 lb Annual discharge: 3.5 x 365 days = 1.280 lb	1,280
Greater Milwaukee River Reach MI-17	Average flow: 246 MGD Median concentration: 0.083 mg/L Average daily mass: 8.34*0.083*246 = 170.3 lb Annual TP mass: 170.3 x 365 = 62,160 lb	62,160

Grafton's proportional share within the Milwaukee River is computed as follows:

$$\text{The Village of Grafton share} = \frac{1{,}280\ lb\ from\ the\ WWTP}{62{,}160\ lb\ TP\ mass\ in\ the\ Milwaukee\ River} x\ 100 = 2\%$$

An inventory of agricultural operation non-point source reduction opportunities within the Milwaukee River watershed upstream from the Grafton WWTP outfall was included in the original plan, which identified approximately 25,000 acres of farmland in the targeted areas of MI-17 and MI-16. The following table contains a summary of the farmland inventory, along with an initial baseline phosphorus yield using SnapPlus Nutrient Management Software modeling and current typical farm practices.

Table 6 | Farmland Inventory with Baseline Phosphorus Mass Projections from SnapPlus

Type of Ag Operation	% of Land	Acres of Ag type (acres)	Baseline P (lb)
Cash Grain	40%	10,000	66,560
Livestock	60%	15,000	53,490
Total		25,000	120,050

Grafton supported improvements on almost 3,700 acres of farmland that yielded over 5,000 lbs of reduction in 2025. There is ample additional acreage and phosphorus reductions remaining.

2.4 Identify Where Reduction Will Occur

The AM plan targets agricultural phosphorus reductions throughout the action area and upstream from the action area (within the Greater Milwaukee River Reaches MI-16 and MI-17). The reductions necessary to return the Milwaukee River to the total phosphorus instream criterion of 0.075 mg/L will come from agricultural source reductions, along with the wastewater treatment plant maintaining current effluent phosphorus discharges.

2.4.1 Area 1 – Agricultural Improvements Within Reaches MI-16 and MI-17

Grafton will continue to promote agricultural phosphorus reductions from cash grain and livestock operations within the MI-17 reach and upriver within the MI-16 reach. As presented in the watershed inventory section of this plan, previous modeling suggests that baseline phosphorus runoff from 25,000 acres of agricultural lands in the targeted areas of MI-16 and MI-17 far exceeds the needed total reduction target of 5,990 lb/yr. Grafton, working together with regional partners Ozaukee County and Milwaukee River Watershed Clean Farm Families (MRWCFF), will continue to promote best management practices (BMPs) that support phosphorus reductions to the watershed.

SnapPlus modeling was performed for typical cash grain and livestock operations to determine the impact of the most probable BMPs for phosphorus reductions. The following table lists the BMPs that were included in the modeling for each ag practice.

Table 7 | Most Probable Best Management Practices for Phosphorus Reduction

Cash Grain Ag Operation	Livestock
Reduction in tillage (e.g., chisel plow-field cultivator to no-till or shallow vertical till)	Reduction in tillage (e.g., chisel plow-field cultivator to no-till or shallow vertical till)
Addition of cover crops	Addition of cover crops
Addition of in-field designed filter strips	Addition of in-field designed filter strips
Addition of edge-of-field designed filter strips	Addition of edge-of-field designed filter strips
Reshape existing grass waterways that no longer function properly	Reshape existing grass waterways that no longer function properly
Maximize green, living cover on the field during likely periods of runoff	Maximize green, living cover on the field during likely periods of runoff
Conservation crop rotation use	Conservation crop rotation use
Change in timing of tillage (e.g., fall to spring)	Change in timing of tillage (e.g., fall to spring)
Reduction in fertilizer application rates	Change in timing, application method, and rate per application of manure

The modeling results are summarized in the following table from the baseline condition in Table 6.

Table 8 | SnapPlus Modeling Phosphorus Mass Reduction Projections

Type of Ag Operation	Baseline P (lb)	P Release After Implementing BMPs (lb)	% Reduction
Cash Grain	66,560	42,600	36%
Livestock	53,490	35,840	33%
Total	**120,050**	78,440	**34.7%**

The results from the modeling indicate that reductions of phosphorus runoff are possible, approximately 2.4 lb/ac for cash grain operations and 1.2 lb/ac for livestock operations, if all the BMPs listed in Table 2-4 are implemented. Grafton has signed memorandums of understanding (MOUs) with seven farmers for the 2024/2025 crop year covering almost 3,700 acres. These seven farmers accounted for over 5,000 lbs of P reduction.

Grafton has engaged in watershed reductions that have been modelled to exceed the annual target reduction of 5.990 lb, and yet the median P concentration has not been reduced. Grafton believes it is necessary to maintain the current level of P reductions for a period of time to determine if the median P concentration will decrease. The village intends to maintain for a period of 2 years the current level of agricultural reductions and plant performance to determine if phosphorus delivery will be reduced, and a response will be measured within the river. The village will then resume expanding agricultural reductions by approximately 1,000 lb per year starting in year 3 unless the annual median concentration is at or below the water quality value. The village does not believe a 5-year period is enough for farm field reductions to be realized in the river. The village will instead pursue mass reductions over 10 years.

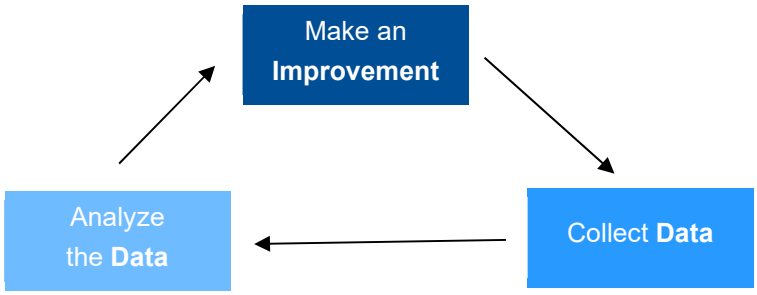
2.4.2 Target Reductions

The AM plan targets phosphorus reductions to the Milwaukee River from agricultural sources to maintain a target reduction of 5,000 lbs/year from agricultural fields for years 1 and 2, then increase by a total of 3,000 lbs spread over years 3 through 5. The village will also maintain a 1,000 lbs/year reduction at the WWTP as compared to the effluent P concentration when the program began. The total P reduction will be maintained at over 6,000 lb/yr.

It is necessary to establish a minimum reduction value to determine eligibility to continue with adaptive management for a third permit term. For the first permit term, the minimum reduction value was determined by using the Village's proportional share of phosphorus in the river. The Village's proportional share at the time of the first permit term was calculated to be 4.8% and the minimum reduction value was 320 lb. The village's proportional share for the second permit term is estimated at 2% and the minimum reduction value using this approach would be 2% of 5,990 lbs or about 120 lbs per year. The rules for Adaptive Management require that the minimum value for eligibility for permit term 3 cannot be smaller than it was for permit term 2.

An alternative approach for determining the minimum value must be used. In place of using the proportional share, village proposes to establish the minimum reduction value set equal to the estimated mass reduction achieved during the final year of the first permit term or approximately 6,000 lbs per year."

Th AM plan target reduction will be adjusted as more data is collected through Milwaukee River monitoring. Grafton will review the river monitoring data, consult with partners to identify areas for reductions, develop projects that achieve reductions, implement projects, and monitor the results. This iterative approach to achieving compliance will allow Grafton to adjust as needed.



If the data indicates that the water quality criterion has been achieved, watershed improvement work will be suspended to continue to collect more data.

2.5 Describe Management Measures

Grafton plans to continue working with Ozaukee County and MRWCFF to promote cover crop, no-till farming, and various hard or permanent practices. Some farmers in the region have experience with soil health land management practices and are helping to advocate and promote such practices to other farmers in the region. The level of participation with Grafton's initial effort signals that this approach is being received well by MRWCFF members.

Table 2-4 from the preceding section highlights several other practices that are being considered. These practices include:

- Reduction in tillage (e.g., chisel plow-disc to strip or no-till)
- Addition of in-field designed filter strips
- Addition of edge-of-field designed filter strips
- Reshape existing grass waterways that no longer function properly
- Reduction in fertilizer or manure application rates
- Conservation crop rotation use
- Change in timing of tillage (e.g., fall to spring)
- Change in the timing, method, and rate per application of manure

2.6 Estimate Load Reductions During Permit Term

Grafton aims to lower the median phosphorus concentration in the Milwaukee River toward the WQBEL criterion during the second 5-year permit term. The village will target maintaining the current load reduction of about 6,000 lb. The following preliminary schedule outlines Grafton's annual goals.

Table 9 | Tentative Project Schedule | Second 5-Year Permit Term

Year	Activities	Projected Annual Phosphorus Reduction (lb/yr)	Accumulated Total Annual Phosphorus Reduction (lb/yr)
1	Action area sampling and improvements in the Greater Milwaukee River Non-Point Area within reaches MI-16 and MI-17 and maintaining WWTP P removal performance.	0	6,000
2	Action area sampling and improvements in the Greater Milwaukee River Non-Point Area within reaches MI-16 and MI-17 and maintaining WWTP P removal performance.	0	6,000
3	Action area sampling and improvements in the Greater Milwaukee River Non-Point Area within reaches MI-16 and MI-17 and maintaining WWTP P removal performance.	1,000	7,000
4	Action area sampling and improvements in the Greater Milwaukee River Non-Point Area within reaches MI-16 and MI-17 and maintaining WWTP P removal performance.	1,000	8,000
5	Action area sampling and improvements in the Greater Milwaukee River Non-Point Area within reaches MI-16 and MI-17 and maintaining WWTP P removal performance.	1,000	9,000

By the end of this 5-year project schedule, Grafton will be responsible for phosphorus reductions within the Greater Milwaukee River reaches MI-16 and MI-17 of at least 9,000 lb per year. This mass reduction exceeds the calculated estimate necessary to lower the in-river phosphorus concentration to match the water quality value, but may not be sufficient to determine the success of the AM plan.

Grafton will revise this project schedule based on the results from the monitoring program.

Some examples of adjustments include:

- Data showing that projects in the Greater Milwaukee River reaches MI-16 and MI-17 are not being realized, as phosphorus reductions could increase agricultural improvements.
- Data showing that the Milwaukee River is complying with water quality criterion could result in suspending the project schedule and continuing to monitor the Milwaukee River.

2.7 Identify How Success Will Be Measured

The goal is to lower the median in-river phosphorus concentration toward the applicable water quality criterion at the pour point of the action area (designated as sample location 2). Success will be determined in one of two ways:

- Direct assessment in accordance with NR 102.52 (2)(c), which states that attainment determination shall be made by directly comparing the sample median to the water quality criterion.
- Or, a combined assessment in accordance with NR 102.60 (1)(b), which states that a combined assessment approach for total phosphorus attainment can be used when the median concentration exceeds the criterion but is within the combined assessment range. The combined assessment range is equal to two (2) times the criterion.

The water quality criterion is:

- The State of Wisconsin standard value of 0.075 mg/L for this section of the Milwaukee River, or
- A State and U.S. EPA-approved site-specific criterion, or
- Any change to the State of Wisconsin standard value for this section of the Milwaukee River.

Interim successes will be measured under the following:

- Phosphorus concentration decreases throughout the action area, but perhaps not all the way to the water quality criterion.
- Improved biological metrics or water clarity measurements support improving aquatic habitat.
- Improved soil health resulting from improvements to ag operations. Improved soil health has been linked to water quality improvements.
- SnapPlus modeling results demonstrating that implemented agricultural BMPs reduce phosphorus runoff.

Annual reports will summarize all activities that have occurred over the preceding year, along with identifying interim successes, SnapPlus modeling investigations, and any quantitative measurements of water quality improvements. The annual report for the 2024/2025 crop year is included in the appendix. This annual report is normally due in March of the year following data collection.

If Grafton collects data that shows the annual median phosphorus concentration is at or below the criterion (direct assessment approach for determining success), it intends to suspend all future project work but complete work that is already in progress. Monitoring will continue to confirm that the water quality criterion is being met. Grafton will resume project work should the results from continued monitoring of the river phosphorus concentration show that the criterion is being exceeded.

2.8 Describe Financial Security

Grafton has a track record of providing financial support for AM. The following is an estimate of its expenditures.

Table 10 | Annual Expenditures by Grafton On Adaptive Management

Annual Expense	2021	2022	2023	2024
AM Administration	$41,000	$41,000	$41,000	$41,000
Ag Incentives	$0	$24,720	$38,311	$46,561
Total	**$41,000**	**$65,720**	**$79,311**	**$87,561**

The annual expense values do not include WWTP operation staff time for Milwaukee River sample collection, lab testing, and lab supplies. Grafton prepares an operating budget each year. A copy of the most recent wastewater operating budget is included in the appendix for 2025. The total wastewater 2025 estimated revenue for the wastewater utility is $4.19 million. The total 2025 estimated operating expenses are $3.189 million. Included under contracted services found on P. 6 of the operating budget are the following:

- $80,000 for Adaptive Management/Farm Practice Improvements
- $77,500 for Phosphorus Plan Admin/Field Monitoring

The operating expenses for adaptive management account for less than 5% of the total operating expenses, and less than 4% of the operating revenue for the wastewater utility. Grafton has the financial stability to continue funding the AM program through the wastewater utility operating budget.

2.9 Implementation Schedule With Milestones

Grafton is prepared to continue to implement this AM plan beginning in 2026, with the goal of reducing the median total phosphorus concentration toward water quality standards by 2031. The sample of the initial schedule for achieving compliance is as follows:

Table 11 | Sample of the Initial Implementation Schedule

Date	Activities	Notes
Fall 2025	Initiate agricultural support for the 2025/2026 crop year.	This has been done.
December 2025	Submit annual report for 2024/2025 crop year.	This report summarizes the results of the Milwaukee River monitoring, along with any BMP installation within the Greater Milwaukee River reaches M16 and M17.
May 1, 2026	Resume monitoring of the Milwaukee River throughout the action area.	This activity will be performed by Grafton in accordance with the sampling plan. This activity will continue through October.
Fall 2026	Initiate agricultural support for the 2026/2027 crop year.	
March 31, 2027	Submit annual report for 2025/2026 Crop Year.	This report will summarize the results of the Milwaukee River monitoring, along with any BMP installation within the Greater Milwaukee River reaches M16 and M17. The report will identify projects to be implemented in the next crop year.
May 1, 2027	Resume monitoring of the Milwaukee River throughout the action area.	
Fall 2027	Initiate agricultural support for the 2027/2028 crop year.	

This sample schedule covers the first 2 years of the updated 5-year AM plan. The annual report will include a schedule for the preceding year until the end of the 5-year permit term.

Appendix A
WPDES Permit

WISCONSIN
DEPT. OF NATURAL RESOURCES

WPDES PERMIT

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

PERMIT TO DISCHARGE UNDER THE WISCONSIN POLLUTANT DISCHARGE ELIMINATION SYSTEM

Village of Grafton Water & Wastewater Utility

is permitted, under the authority of Chapter 283, Wisconsin Statutes, to discharge from a facility located at
1900 9th Avenue, Grafton WI
to
Milwaukee River South (Milwaukee River (South) Watershed, Milwaukee River Basin) in Ozaukee County

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in this permit.

The permittee shall not discharge after the date of expiration. If the permittee wishes to continue to discharge after this expiration date an application shall be filed for reissuance of this permit, according to Chapter NR 200, Wis. Adm. Code, at least 180 days prior to the expiration date given below.

State of Wisconsin Department of Natural Resources
For the Secretary

By _____
Bryan Hartsook
Wastewater Field Supervisor

02/26/2021
Date Permit Signed/Issued

PERMIT TERM: EFFECTIVE DATE - March 01, 2021 **EXPIRATION DATE - December 31, 2025**

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1 Influent Requirements

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
701	INFLUENT: 24-hr flow proportional composite sampler is located in the north service building MIP room with intake in the headworks building after the bar screen and prior to grit chamber. Influent flow measured with an 18-inch Parshall flume located immediately upstream of influent lift pumps and downstream of grit chamber. Plant sidestreams are not included in influent flow measure or sample.

1.2 Monitoring Requirements

The permittee shall comply with the following monitoring requirements.

1.2.1 Sampling Point 701 - INFLUENT PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD_5, Total		mg/L	4/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	4/Week	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Annual	24-Hr Flow Prop Comp	See 'Mercury Monitoring' section below.

1.2.1.1 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

2 In-Plant Requirements

2.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
107	Collect the mercury field blank using standard sample handling procedures.

2.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

2.2.1 Sampling Point 107 - Mercury Field Blank

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Annual	Blank	See 'Mercury Monitoring' section below.

2.2.1.1 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

3 Surface Water Requirements

3.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
001	EFFLUENT: 24-hr flow proportional composite sampler located immediately prior to UV disinfection process. Grab samples taken after aeration and UV disinfection.
601	In-stream Sampling Point 601: Representative water samples shall be collected from the Milwaukee River. Sample Point 601 is located downstream of the Grafton Water & Wastewater Utility outfall, at the County Highway T Bridge (43.29477N, -87.94385W). Sample point 601 correlates with the sample location described in the approved AM Plan No. WQT-2020-0012 (January 2020).

3.2 Monitoring Requirements and Effluent Limitations

The permittee shall comply with the following monitoring requirements and limitations.

3.2.1 Sampling Point (Outfall) 001 - EFFLUENT

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD_5, Total	Weekly Avg	45 mg/L	4/Week	24-Hr Flow Prop Comp	November - April
BOD_5, Total	Weekly Avg	33 mg/L	4/Week	24-Hr Flow Prop Comp	May - October
BOD_5, Total	Monthly Avg	30 mg/L	4/Week	24-Hr Flow Prop Comp	Year-round
Suspended Solids, Total	Weekly Avg	45 mg/L	4/Week	24-Hr Flow Prop Comp	November - January
Suspended Solids, Total	Weekly Avg	12 mg/L	4/Week	24-Hr Flow Prop Comp	February - October
Suspended Solids, Total	Monthly Avg	12 mg/L	4/Week	24-Hr Flow Prop Comp	Year-round
Suspended Solids, Total	Weekly Avg	261 lbs/day	Weekly	Calculated	Limit effective in January.
Suspended Solids, Total	Weekly Avg	298 lbs/day	Weekly	Calculated	Limit effective in November.
Suspended Solids, Total	Weekly Avg	252 lbs/day	Weekly	Calculated	Limit effective in December.
Nitrogen, Ammonia (NH_3-N) Total	Daily Max	20 mg/L	4/Week	24-Hr Flow Prop Comp	Limit effective November through April.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	16 mg/L	4/Week	24-Hr Flow Prop Comp	November - March

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	10 mg/L	4/Week	24-Hr Flow Prop Comp	Limit effective in April.
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	17 mg/L	4/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH_3-N) Total	Weekly Avg	14 mg/L	4/Week	24-Hr Flow Prop Comp	Limit effective in October.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	10 mg/L	4/Week	24-Hr Flow Prop Comp	November - March
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	6.3 mg/L	4/Week	24-Hr Flow Prop Comp	Limit effective in April.
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	12 mg/L	4/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH_3-N) Total	Monthly Avg	9.0 mg/L	4/Week	24-Hr Flow Prop Comp	Limit effective in October.
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	6.0 mg/L	5/Week	Grab	Limit effective May through October. Monitoring only November through April.
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	Weekly	Grab	Limit effective May through September annually until the E. coli limit goes into effect per the Effluent Limitations for E. coli Schedule.
E. coli		#/100 ml	Weekly	Grab	Monitoring only May through September annually until the final limit goes into effect per the Effluent Limitations for E. coli Schedule.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit effective May through September annually per the Effluent Limitations for E. coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May through September annually per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Annual	Grab	See the Mercury Monitoring section below.
Phosphorus, Total	Monthly Avg	1.0 mg/L	4/Week	24-Hr Flow Prop Comp	This is a technology-based limit that goes into effect upon permit reissuance and remains in effect throughout the permit term. This limit also serves as an interim limit until the 0.6 mg/L adaptive management interim limit takes effect on May 1, 2021.
Phosphorus, Total	6-Month Avg	0.6 mg/L	4/Week	24-Hr Flow Prop Comp	This is an Adaptive Management interim limit that goes into effect May 1, 2021. An interim limit of 0.5 mg/L may be effective during future permit terms. See the Schedules section and effluent requirements below.
Phosphorus, Total		lbs/day	Monthly	Calculated	Calculate the daily mass discharge of phosphorus in lbs/day on the same days phosphorus sampling occurs.
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TU_a	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annually in rotating quarters. See WET Testing subsection below.
Chronic WET	Monthly Avg	2.6 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annually in rotating quarters. See WET Testing subsection below.

3.2.1.1 Annual Average Design Flow

The annual average design flow of the permittee's wastewater treatment facility is 2.5 MGD.

3.2.1.2 E. coli Percent Limit

No more than 10 percent of E. coli bacteria samples collected in any calendar month may exceed 410 #/100 ml. Bacteria samples may be collected more frequently than required. All samples shall be reported on the monthly discharge monitoring reports (DMRs). The following calculation should be used to calculate percent exceedances.

$$\frac{\#\ of\ Samples\ greater\ than\ 410\ \#/100}{Total\ \#\ of\ samples} \times 100 = \%\ Exceedance$$

3.2.1.3 Mercury Monitoring

The permittee shall collect and analyze all mercury samples according to the data quality requirements of ss. NR 106.145(9) and (10), Wisconsin Administrative Code. The limit of quantitation (LOQ) used for the effluent and field blank shall be less than 1.3 ng/L, unless the samples are quantified at levels above 1.3 ng/L. The permittee shall collect at least one mercury field blank for each set of mercury samples (a set of samples may include combinations of intake, influent, effluent or other samples all collected on the same day). The permittee shall report results of samples and field blanks to the Department on Discharge Monitoring Reports.

3.2.1.4 Whole Effluent Toxicity (WET) Testing

Primary Control Water: Milwaukee River (South) upstream and out of the influence of the mixing zone of Outfall 001, and any other known discharges.

Instream Waste Concentration (IWC): 39%

Dilution series: At least five effluent concentrations and dual controls must be included in each test.

- **Acute:** 100, 50, 25, 12.5, 6.25% and any additional selected by the permittee.
- **Chronic:** 75, 50, 25, 12.5% and any additional selected by the permittee.

WET Testing Frequency:

Acute tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

- **Acute:** April-June 2021, October-December 2022, July-September 2023, January-March 2024, April-June 2025

Acute WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in April-June 2026.

Chronic tests shall be conducted once each year in rotating quarters in order to collect seasonal information about the discharge. Tests are required during the following quarters.

- **Chronic:** April-June 2021, October-December 2022, July-September 2023, January-March 2024, April-June 2025

Chronic WET testing shall continue after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the last full calendar year of this permit. For example, the next test would be required in April-June 2026.

Testing: WET testing shall be performed during normal operating conditions. Permittees are not allowed to turn off or otherwise modify treatment systems, production processes, or change other operating or treatment conditions during WET tests.

Reporting: The permittee shall report test results on the Discharge Monitoring Report form, and also complete the "Whole Effluent Toxicity Test Report Form" (Section 6, "*State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition*"), for each test. The original, complete, signed version of the Whole Effluent Toxicity Test Report Form shall be sent to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., P.O. Box 7921, Madison, WI 53707-7921, within 45 days of test completion. The Discharge Monitoring Report (DMR) form shall be submitted electronically by the required deadline.

Determination of Positive Results: An acute toxicity test shall be considered positive if the Toxic Unit - Acute (TU_a) is greater than 1.0 for either species. The TU_a shall be calculated as follows: $TU_a = 100 \div LC_{50}$. A chronic toxicity test shall be considered positive if the Toxic Unit - Chronic (TU_c) is greater than 2.6 for either species. The TU_c shall be calculated as follows: $TU_c = 100 \div IC_{25}$.

Additional Testing Requirements: Within 90 days of a test which showed positive results, the permittee shall submit the results of at least 2 retests to the Biomonitoring Coordinator on "Whole Effluent Toxicity Test Report Forms". The 90-day reporting period shall begin the day after the test which showed a positive result. The retests shall be completed using the same species and test methods specified for the original test (see the Standard Requirements section herein).

3.2.1.5 Total Maximum Daily Load (TMDL) Limitations

Approved TMDL: The Milwaukee River Basin TMDL Waste Load Allocation (WLA) for Total Phosphorus, and Total Suspended Solids was approved by the U.S. Environmental Protection Agency in March 2018. The approved TMDL WLA limits for Total Suspended Solids and Total Phosphorus are shown in the table below:

Month	Weekly Ave TSS Effluent Limit (lbs/day)	Monthly Ave Phosphorus Effluent Limit (lbs/day)
Jan	261.38	2.94
Feb	-	3.41
Mar	-	2.81
Apr	-	2.95
May	-	3.11
Jun	-	3.22
Jul	-	2.80
Aug	-	2.71
Sep	-	2.88
Oct	-	2.33
Nov	298.49	2.95
Dec	251.78	2.66

3.2.1.6 Total Phosphorus Interim Limit, Averaging Periods and Compliance Determination

The adaptive management total phosphorus interim limit of 0.6 mg/L goes into effect May 1, 2021 beginning the averaging period from May 1, 2021 through October 30, 2021. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30th and October 31st annually.

3.2.1.7 Phosphorus Limitation(s) and Adaptive Management Requirements

The Village of Grafton Water & Wastewater Utility has requested, and the Department has approved, a plan to implement a watershed adaptive management approach under s. NR 217.18, Wis. Adm. Code and s. 283.13(7),

Wis. Stats. as a means for the waterbodies listed in the plan to attain the applicable phosphorus water quality standard in s. NR 102.06, Wis. Adm. Code. The phosphorus limitations and conditions in this permit reflect the approved adaptive management plan WQT-2020-0012 (January 2020). Failure to implement terms and conditions of this section is a violation of this permit. The permittee shall design and implement actions identified in AM Plan No. WQT-2020-0012 (January 2020) in accordance with the goals and measures identified in the approved plan. If total phosphorus loadings within the Milwaukee River action area, as identified in WQT-2020-0012 (January 2020), are not reduced by at least 322 pounds per year by December 31st, 2025, the watershed adaptive management option may not be available to the permittee upon permit reissuance.

Pursuant to s. NR 217.18(3)(e)(2), Wis. Adm. Code, the adaptive management interim limitation is 0.6 mg/L, expressed as a six-month average. Additionally, a 1.0 mg/L limitation expressed as a monthly average is required. The final calculated water quality-based effluent limitations for phosphorus are based on the Milwaukee River TMDL and are listed in the table in section 3.2.1.5 above.

These limitations may be recalculated based on changes in the in-stream data at the time of permit reissuance. These limits will become effective on January 1, 2026 unless the adaptive management project is terminated per s. NR 217.18(3)(g), Wis. Adm. Code, in which case the limits may be imposed at an earlier date, or the phosphorus reductions specified in the adaptive management plan have been achieved.

3.2.1.8 Adaptive Management Reopener Clause

Per s. NR 217.18(3), Wis. Adm. Code, the Department may terminate the adaptive management option for a permittee through permit modification or at permit reissuance and require compliance with a phosphorus effluent limitation calculated under s. NR 217.13, Wis. Adm. Code, or a US EPA approved TMDL based on any of the following reasons:

1. Failure to implement the adaptive management actions in accordance with the approved adaptive management plan and compliance schedule established in the permit.
2. New information becomes available that changes the Department's determinations made under s. NR 217.18(2), Wis. Adm. Code.
3. Circumstances beyond the permittee's control have made compliance with the applicable phosphorus criterion in s. NR 102.06, Wis. Adm. Code, pursuant to the plan's goals and measures infeasible.
4. A determination by the Department that sufficient reductions have not been achieved to timely reduce the amount of total phosphorus to meet the criteria in s. NR 102.06, Wis. Adm. Code.

3.2.1.9 Adaptive Management Requirements – Optimization

The permittee shall continue to optimize performance to control phosphorus discharges in accordance with s. NR 217.18(3)(c), Wis. Adm. Code.

3.2.2 Sampling Point 601 - Milwaukee River Downstream

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow River		cfs	Monthly	Measure	Provide an estimate of river flow for each day that in-stream phosphorus monitoring is performed May 1 through October 31 annually.

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow River		cfs	Per Occurrence	Measure	Voluntary river flow estimates for each day that in-stream phosphorus monitoring is performed November 1 through April 30 annually.
Phosphorus, Total		mg/L	Monthly	Grab	Collect samples monthly May 1 through October 31 annually. See permit subsections for sampling and reporting requirements.
Phosphorus, Total		mg/L	Per Occurrence	Grab	Voluntary monitoring November 1 through April 30 annually. See permit subsections for sampling and reporting requirements.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate and report total monthly phosphorus loads for the months of May through October annually. See permit subsections for calculation of total monthly loads.
Phosphorus, Total		lbs/month	Per Occurrence	Calculated	Calculated total phosphorus loads may also be reported for the months of November through April, as data is available. See permit subsections for calculation of total monthly loads.

3.2.2.1 Surface Water Sampling for Total Phosphorus

Surface water sampling shall be performed in accordance with Adaptive Management Plan No. WQT-2020-0012 (January 2020). When sampling surface waters for total phosphorus, sample collection and handling protocol as specified in Chapter 4 of the "Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges" shall be followed. (Available at dnr.wi.gov; search for "phosphorus guidance").

When testing for total phosphorus in surface water samples, use the test procedures specified by Standard Requirements permit section. Analytical methods used shall enable the laboratory to quantitate total phosphorus at levels below the water quality criterion of 0.075 mg/L. If the required level of quantitation cannot be met by any of the methods available in ch. NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected.

When surface water samples are collected by Water Action Volunteers, the "The Volunteer Monitor's Guide to Quality Assurance Project Plans" shall be implemented. (Available at www.epa.gov; search for "The Volunteer Monitor's Guide to Quality Assurance Project Plans").

3.2.2.2 Voluntary Surface Water Sampling for Total Phosphorus

River flow and total phosphorus monitoring may voluntarily be performed from November 1 through April 30 annually. When voluntary in-stream monitoring is completed, monitoring results shall be reported on the monthly eDMR. Report river flow measurements for each day phosphorus monitoring is performed.

3.2.2.3 Reporting Surface Water Sampling Results for Total Phosphorus and Flow

The permittee shall report total phosphorus monitoring and river flow measurements results for surface waters samples collected at Sampling Point 601 along with the river flow measurements at Sampling Point 601 on monthly eDMRs. The monitoring results shall be submitted by the date specified on the eDMR.

In addition, all total phosphorus test results for surface water samples collected at Sampling Point 601 and all other surface water sampling points identified in Adaptive Management Plan No. WQT-2020-0012 (January 2020) shall be reported to the Department using the Department's Laboratory Data Entry System (LDES). Test results for the year shall be submitted by January 21st of the following year. (Available at dnr.wi.gov; search "Laboratory Data Entry System").

3.2.2.4 Total Monthly Total Phosphorus (TP) Loads

Use the following methods to calculate the total monthly phosphorus loading in the receiving stream expressed as a mass in lbs/month:

1) Convert mg/L to lbs/day using the following equation:

Daily TP loading (lbs/day) = TP concentration (mg/L) × [Daily Flow (cfs) ÷ 1.55] × 8.34

2) On a monthly basis, average the reported daily TP loading, then multiply the average by the number of days during the month and report the product as "Phosphorus, Total" (in lbs/month) for the last day of the month on the eDMR.

Phosphorus, Total (lbs/month) = Average of daily TP loading (lbs/day) × Number of days/month

4 Land Application Requirements

4.1 Sampling Point(s)

The discharge(s) shall be limited to land application of the waste type(s) designated for the listed sampling point(s) on Department approved land spreading sites or by hauling to another facility.

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, WasteType/Sample Contents and Treatment Description (as applicable)**
002	Anaerobically digested, gravity belt thickened, Class B, liquid sludge. Representative samples shall be taken from the sludge hauler truck fill pipe. Sludge samples shall be collected prior to land application and test results shall be reported on Form 3400-49 'Waste Characteristics Report'. Hauled sludge reports shall be submitted on Form 3400-52 'Other Methods of Disposal or Distribution Report' following each year that the sludge is hauled.

4.2 Monitoring Requirements and Limitations

The permittee shall comply with the following monitoring requirements and limitations.

4.2.1 Sampling Point (Outfall) 002 - Hauled Sludge

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH_4-N) Total		Percent	Annual	Composite	See permit section 4.2.1.1

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total		Percent	Annual	Composite	See permit section 4.2.1.1
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	See permit section 4.2.1.1
Potassium, Total Recoverable		Percent	Annual	Composite	See permit section 4.2.1.1
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sample once in 2022.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sample once in 2022.

Other Sludge Requirements	
Sludge Requirements	**Sample Frequency**
List 3 Requirements – Pathogen Control: The requirements in List 3 shall be met prior to land application of sludge.	**Annual**
List 4 Requirements – Vector Attraction Reduction: The vector attraction reduction shall be satisfied prior to, or at the time of land application as specified in List 4.	**Annual**

4.2.1.1 List 2 Analysis

If the monitoring frequency for List 2 parameters is more frequent than "Annual" then the sludge may be analyzed for the List 2 parameters just prior to each land application season rather than at the more frequent interval specified. Monitoring requirements for Total Ammonium Nitrogen, Total Phosphorus, Water Extractable Phosphorus, and Total Recoverable Potassium is required only when land application occurs under this permit. In the event direct land application occurs under this permit, the Department should be notified 60 days prior to land application.

4.2.1.2 Changes in Feed Sludge Characteristics

If a change in feed sludge characteristics, treatment process, or operational procedures occurs which may result in a significant shift in sludge characteristics, the permittee shall reanalyze the sludge for List 1, 2, 3 and 4 parameters each time such change occurs.

4.2.1.3 Multiple Sludge Sample Points (Outfalls)

If there are multiple sludge sample points (outfalls), but the sludges are not subject to different sludge treatment processes, then a separate List 2 analysis shall be conducted for each sludge type which is land applied, just prior to land application, and the application rate shall be calculated for each sludge type. In this case, List 1, 3, and 4 and PCBs need only be analyzed on a single sludge type, at the specified frequency. If there are multiple sludge sample points (outfalls), due to multiple treatment processes, List 1, 2, 3 and 4 and PCBs shall be analyzed for each sludge type at the specified frequency.

4.2.1.4 Sludge Which Exceeds the High-Quality Limit

Cumulative pollutant loading records shall be kept for all bulk land application of sludge which does not meet the high-quality limit for any parameter. This requirement applies for the entire calendar year in which any exceedance of Table 3 of s. NR 204.07(5)(c), is experienced. Such loading records shall be kept for all List 1 parameters for each site land applied in that calendar year. The formula to be used for calculating cumulative loading is as follows:

[(Pollutant concentration (mg/kg) x dry tons applied/ac) ÷ 500] + previous loading (lbs/acre) = cumulative lbs pollutant per acre

When a site reaches 90% of the allowable cumulative loading for any metal established in Table 2 of s. NR 204.07(5)(b), the Department shall be so notified through letter or in the comment section of the annual land application report (3400-55).

4.2.1.5 Sludge Analysis for PCBs

The permittee shall analyze the sludge for Total PCBs one time during **2022**. The results shall be reported as "PCB Total Dry Wt". Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with Table EM in s. NR 219.04, Wis. Adm. Code and the conditions specified in Standard Requirements of this permit. PCB results shall be submitted by January 31, following the specified year of analysis.

4.2.1.6 Lists 1, 2, 3, and 4

List 1 **TOTAL SOLIDS AND METALS** See the Monitoring Requirements and Limitations table above for monitoring frequency and limitations for the List 1 parameters
Solids, Total (percent)
Arsenic, mg/kg (dry weight)
Cadmium, mg/kg (dry weight)
Copper, mg/kg (dry weight)
Lead, mg/kg (dry weight)
Mercury, mg/kg (dry weight)
Molybdenum, mg/kg (dry weight)
Nickel, mg/kg (dry weight)
Selenium, mg/kg (dry weight)
Zinc, mg/kg (dry weight)

List 2 **NUTRIENTS** See the Monitoring Requirements and Limitations table above for monitoring frequency for the List 2 parameters
Solids, Total (percent)
Nitrogen Total Kjeldahl (percent)
Nitrogen Ammonium (NH4-N) Total (percent)
Phosphorus Total as P (percent)
Phosphorus, Water Extractable (as percent of Total P)
Potassium Total Recoverable (percent)

List 3
PATHOGEN CONTROL FOR CLASS B SLUDGE

The permittee shall implement pathogen control as listed in List 3. The Department shall be notified of the pathogen control utilized and shall be notified when the permittee decides to utilize alternative pathogen control.

The following requirements shall be met prior to land application of sludge.

Parameter	Unit	Limit
Fecal Coliform*	MPN/gTS or CFU/gTS	2,000,000
OR, ONE OF THE FOLLOWING PROCESS OPTIONS		
Aerobic Digestion	Air Drying	
Anaerobic Digestion	Composting	
Alkaline Stabilization	PSRP Equivalent Process	

* The Fecal Coliform limit shall be reported as the geometric mean of 7 discrete samples on a dry weight basis.

List 4
VECTOR ATTRACTION REDUCTION

The permittee shall implement any one of the vector attraction reduction options specified in List 4. The Department shall be notified of the option utilized and shall be notified when the permittee decides to utilize an alternative option.

One of the following shall be satisfied prior to, or at the time of land application as specified in List 4.

Option	Limit	Where/When it Shall be Met
Volatile Solids Reduction	≥38%	Across the process
Specific Oxygen Uptake Rate	≤1.5 mg O_2/hr/g TS	On aerobic stabilized sludge
Anaerobic bench-scale test	<17 % VS reduction	On anaerobic digested sludge
Aerobic bench-scale test	<15 % VS reduction	On aerobic digested sludge
Aerobic Process	>14 days, Temp >40°C and Avg. Temp > 45°C	On composted sludge
pH adjustment	>12 S.U. (for 2 hours) and >11.5 (for an additional 22 hours)	During the process
Drying without primary solids	>75 % TS	When applied or bagged
Drying with primary solids	>90 % TS	When applied or bagged
Equivalent Process	Approved by the Department	Varies with process
Injection	-	When applied
Incorporation	-	Within 6 hours of application

5 Schedules

5.1 Effluent Limitations for E. coli

The permittee shall comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification

Required Action	Due Date
Status Update: The permittee shall submit information within the discharge monitoring report (DMR) comment section documenting the steps taken in preparation for properly monitoring and testing for E. coli including, but not limited to, selected test method and location of sampling.	03/31/2021
Operational Evaluation Report: The permittee shall prepare and submit an Operational Evaluation Report to the Department for review and approval. The report shall include an evaluation of collected effluent data and proposed operational improvements that will optimize efficacy of disinfection at the treatment plant during the period prior to complying with final E. coli limitations and, to the extent possible, enable compliance with the final E. coli limitations. The report shall include a plan and schedule for implementation of the operational improvements. These improvements shall occur as soon as possible, but not later than April 30, 2022. The report shall state whether the operational improvements are expected to result in compliance with the final E. coli limitations. The permittee shall implement the operational improvements in accordance with the approved plan and schedule specified in the Operational Evaluation Report and in no case later than April 30, 2022. If the Operational Evaluation Report concludes that the operational improvements are expected to result in compliance with the final E. coli limitations, the permittee shall comply with the final E. coli limitations by April 30, 2022 and the permittee is not required to comply with subsequent milestones identified below in this compliance schedule (‘Submit Facility Plan’, 'Final Plans and Specifications', 'Treatment Plant Upgrade to Meet Limitations', ‘Construction Upgrade Progress Report’, 'Complete Construction', 'Achieve Compliance'). FACILITY PLAN - If the Operational Evaluation Report concludes that operational improvements alone are not expected to result in compliance with the final E. coli limitations, the permittee shall initiate development of a facility plan for meeting final E. coli limitations and comply with the remaining required actions in this schedule of compliance. If the Department disagrees with the conclusion of the report, and determines that the permittee can achieve final E. coli limitations using the existing treatment system with only operational improvements, the Department may reopen and modify the permit to include an implementation schedule for achieving the final E. coli limitations sooner than April 30, 2025.	11/30/2021
Submit Facility Plan: If the Operational Evaluation Report concluded that the permittee cannot achieve final E. coli limitations with operational improvements alone, the permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2022
Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to achieve compliance with final E. coli limitations and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2023
Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans	09/30/2023

and schedule from the Department pursuant to s. 281.41. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2024
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2025
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	05/01/2025

5.2 Adaptive Management Interim Limit Compliance Update

Required Action	Due Date
Comply with Adaptive Management Interim Limit: The Adaptive Management interim effluent limit of 0.6 mg/L as a six-month average goes into effect. The averaging periods are May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30 and October 31 annually.	05/01/2021

5.3 Watershed Adaptive Management Option Annual Report Submittals

The permittee shall submit annual reports on the implementation of AM Plan No. WQT-2020-0012 (January 2020) as specified in the "Phosphorus Limitation(s) and Adaptive Management Requirements" permit section and the following schedule.

Required Action	Due Date
Annual Adaptive Management Report: Submit an annual adaptive management report. The annual adaptive management report shall: o Identify those actions from the Section 2.4 of the approved adaptive management plan that were completed during the previous calendar year and those actions that are in progress; o Evaluate collected monitoring data; o Document progress in achieving the goals and measures identified in the approved adaptive management plan; o Describe the outreach and education efforts that occurred during the past calendar year; o Identify any corrections or adjustments to the adaptive management plan that are needed to achieve compliance with the phosphorus water quality standards specified in s. NR 102.06, Wis. Adm. Code; o Describe any updates needed to Grafton's approved phosphorus optimization plan; o Submit results from all sample points outlined in AM plan No. WQT-2020-0012 (January 2020) to the Department using the Department's Laboratory Data Entry System (LDES).	03/31/2021
Annual Adaptive Management Report #2: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2022
Annual Adaptive Management Report #3: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2023

Annual Adaptive Management Report #4: Submit an Adaptive Management report with the required information described in this section (see above).	03/31/2024
Final Adaptive Management Report: Submit the final Adaptive Management (AM) report documenting progress made throughout the AM project in meeting the watershed phosphorus reduction target of 6,700 lbs/yr, and in stream water quality standards specified in s. NR 102.06, Wis. Adm. Code. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2020-0012 (January 2020) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, there should be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions.	03/31/2025
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM plan No. WQT-2020-0012 (January 2020) per s. NR 217.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan No. WQT-2020-0012 (January 2020) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per the "Adaptive Management Reopener Clause" permit section, or removed if the adaptive management plan has achieved water quality standards as determined by the Department within the AM action area.	06/30/2025
Achieve Water Quality Standards and Adaptive Management Plan Success: All the receiving waters identified within the AM plan WQT-2020-0012 (January 2020) shall comply with water quality standards specified in s. NR 102.06, Wis. Adm. Code. The permittee shall continue to comply with applicable effluent limits required under s. 217.18(3)(e)(3), Wis. Stats. (0.5 mg/L expressed as a 6-month avg and 1.0 mg/L as a monthly avg) and continue monitoring surface waters per AM plan WQT-2020-0012 (January 2020) at a minimum of monthly May through October for total phosphorus.	01/01/2026

6 Standard Requirements

NR 205, Wisconsin Administrative Code: The conditions in ss. NR 205.07(1) and NR 205.07(2), Wis. Adm. Code, are included by reference in this permit. The permittee shall comply with all of these requirements. Some of these requirements are outlined in the Standard Requirements section of this permit. Requirements not specifically outlined in the Standard Requirement section of this permit can be found in ss. NR 205.07(1) and NR 205.07(2).

6.1 Reporting and Monitoring Requirements

6.1.1 Monitoring Results

Monitoring results obtained during the previous month shall be summarized and reported on a Department Wastewater Discharge Monitoring Report. The report may require reporting of any or all of the information specified below under 'Recording of Results'. This report is to be returned to the Department no later than the date indicated on the form. A copy of the Wastewater Discharge Monitoring Report Form or an electronic file of the report shall be retained by the permittee.

Monitoring results shall be reported on an electronic discharge monitoring report (eDMR). The eDMR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

If the permittee monitors any pollutant more frequently than required by this permit, the results of such monitoring shall be included on the Wastewater Discharge Monitoring Report.

The permittee shall comply with all limits for each parameter regardless of monitoring frequency. For example, monthly, weekly, and/or daily limits shall be met even with monthly monitoring. The permittee may monitor more frequently than required for any parameter.

6.1.2 Sampling and Testing Procedures

Sampling and laboratory testing procedures shall be performed in accordance with Chapters NR 218 and NR 219, Wis. Adm. Code and shall be performed by a laboratory certified or registered in accordance with the requirements of ch. NR 149, Wis. Adm. Code. Groundwater sample collection and analysis shall be performed in accordance with ch. NR 140, Wis. Adm. Code. The analytical methodologies used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. If the required level cannot be met by any of the methods available in NR 219, Wis. Adm. Code, then the method with the lowest limit of detection shall be selected. Additional test procedures may be specified in this permit.

6.1.3 Recording of Results

The permittee shall maintain records which provide the following information for each effluent measurement or sample taken:

- the date, exact place, method and time of sampling or measurements;
- the individual who performed the sampling or measurements;
- the date the analysis was performed;
- the individual who performed the analysis;
- the analytical techniques or methods used; and
- the results of the analysis.

6.1.4 Reporting of Monitoring Results

The permittee shall use the following conventions when reporting effluent monitoring results:

- Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 0.1 mg/L, report the pollutant concentration as < 0.1 mg/L.

- Pollutant concentrations equal to or greater than the limit of detection, but less than the limit of quantitation, shall be reported and the limit of quantitation shall be specified.

- For purposes of calculating NR 101 fees, the 2 mg/l lower reporting limits for BOD_5 and Total Suspended Solids shall be considered to be limits of quantitation

- For the purposes of reporting a calculated result, average or a mass discharge value, the permittee may substitute a "0" (zero) for any pollutant concentration that is less than the limit of detection. However, if the effluent limitation is less than the limit of detection, the department may substitute a value other than zero for results less than the limit of detection, after considering the number of monitoring results that are greater than the limit of detection and if warranted when applying appropriate statistical techniques.

- If no discharge occurs through an outfall, flow related parameters (e.g. flow rate, hydraulic application rate, volume, etc.) should be reported as "0" (zero) at the required sample frequency specified for the outfall. For example: if the sample frequency is daily, "0" would be reported for any day during the month that no discharge occurred.

6.1.5 Compliance Maintenance Annual Reports

Compliance Maintenance Annual Reports (CMAR) shall be completed using information obtained over each calendar year regarding the wastewater conveyance and treatment system. The CMAR shall be submitted and certified by the permittee in accordance with ch. NR 208, Wis. Adm. Code, by June 30, each year on an electronic report form provided by the Department.

In the case of a publicly owned treatment works, a resolution shall be passed by the governing body and submitted as part of the CMAR, verifying its review of the report and providing responses as required. Private owners of wastewater treatment works are not required to pass a resolution; but they must provide an Owner Statement and responses as required, as part of the CMAR submittal.

The CMAR shall be certified electronically by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The certification verifies that the electronic report is true, accurate and complete.

6.1.6 Records Retention

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings or electronic data records for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report or application. All pertinent sludge information, including permit application information and other documents specified in this permit or s. NR 204.06(9), Wis. Adm. Code shall be retained for a minimum of 5 years.

6.1.7 Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or correct information to the Department.

6.1.8 Reporting Requirements – Alterations or Additions

The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:

- The alteration or addition to the permitted facility may meet one of the criteria for determining whether a facility is a new source.
- The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification requirement applies to pollutants which are not subject to effluent limitations in the existing permit.
- The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use of disposal sites not reported during the permit application process nor reported pursuant to an approved land application plan. Additional sites may not be used for the land application of sludge until department approval is received.

6.2 System Operating Requirements

6.2.1 Noncompliance Reporting

Sanitary sewer overflows and sewage treatment facility overflows shall be reported according to the 'Sanitary Sewer Overflows and Sewage Treatment Facility Overflows' section of this permit.

The permittee shall report the following types of noncompliance by a telephone call to the Department's regional office within 24 hours after becoming aware of the noncompliance:

- any noncompliance which may endanger health or the environment;
- any violation of an effluent limitation resulting from a bypass;
- any violation of an effluent limitation resulting from an upset; and
- any violation of a maximum discharge limitation for any of the pollutants listed by the Department in the permit, either for effluent or sludge.

A written report describing the noncompliance shall also be submitted to the Department's regional office within 5 days after the permittee becomes aware of the noncompliance. On a case-by-case basis, the Department may waive the requirement for submittal of a written report within 5 days and instruct the permittee to submit the written report with the next regularly scheduled monitoring report. In either case, the written report shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and if the noncompliance has not been corrected, the length of time it is expected to continue.

A scheduled bypass approved by the Department under the 'Scheduled Bypass' section of this permit shall not be subject to the reporting required under this section.

NOTE: Section 292.11(2)(a), Wisconsin Statutes, requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the Department of Natural Resources **immediately** of any discharge not authorized by the permit. **The discharge of a hazardous substance that is not authorized by this permit or that violates this permit may be a hazardous substance spill. To report a hazardous substance spill, call DNR's 24-hour HOTLINE at 1-800-943-0003.**

6.2.2 Flow Meters

Flow meters shall be calibrated annually, as per s. NR 218.06, Wis. Adm. Code.

6.2.3 Raw Grit and Screenings

All raw grit and screenings shall be disposed of at a properly licensed solid waste facility or picked up by a licensed waste hauler. If the facility or hauler are located in Wisconsin, then they shall be licensed under chs. NR 500-555, Wis. Adm. Code.

6.2.4 Sludge Management

All sludge management activities shall be conducted in compliance with ch. NR 204 "Domestic Sewage Sludge Management", Wis. Adm. Code.

6.2.5 Prohibited Wastes

Under no circumstances may the introduction of wastes prohibited by s. NR 211.10, Wis. Adm. Code, be allowed into the waste treatment system. Prohibited wastes include those:

- which create a fire or explosion hazard in the treatment work;
- which will cause corrosive structural damage to the treatment work;
- solid or viscous substances in amounts which cause obstructions to the flow in sewers or interference with the proper operation of the treatment work;
- wastewaters at a flow rate or pollutant loading which are excessive over relatively short time periods so as to cause a loss of treatment efficiency; and
- changes in discharge volume or composition from contributing industries which overload the treatment works or cause a loss of treatment efficiency.

6.2.6 Bypass

This condition applies only to bypassing at a sewage treatment facility that is not a scheduled bypass, approved blending as a specific condition of this permit, a sewage treatment facility overflow or a controlled diversion as provided in the sections titled 'Scheduled Bypass', 'Blending' (if approved), 'SSO's and Sewage Treatment Facility Overflows' and 'Controlled Diversions' of this permit. Any other bypass at the sewage treatment facility is prohibited and the Department may take enforcement action against a permittee for such occurrences under s. 283.89, Wis. Stats. The Department may approve a bypass if the permittee demonstrates all the following conditions apply:

- The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance. When evaluating feasibility of alternatives, the department may consider factors such as technical achievability, costs and affordability of implementation and risks to public health, the environment and, where the permittee is a municipality, the welfare of the community served; and
- The bypass was reported in accordance with the Noncompliance Reporting section of this permit.

6.2.7 Scheduled Bypass

Whenever the permittee anticipates the need to bypass for purposes of efficient operations and maintenance and the permittee may not meet the conditions for controlled diversions in the 'Controlled Diversions' section of this permit,

the permittee shall obtain prior written approval from the Department for the scheduled bypass. A permittee's written request for Department approval of a scheduled bypass shall demonstrate that the conditions for bypassing specified in the above section titled 'Bypass' are met and include the proposed date and reason for the bypass, estimated volume and duration of the bypass, alternatives to bypassing and measures to mitigate environmental harm caused by the bypass. The department may require the permittee to provide public notification for a scheduled bypass if it is determined there is significant public interest in the proposed action and may recommend mitigation measures to minimize the impact of such bypass.

6.2.8 Controlled Diversions

Controlled diversions are allowed only when necessary for essential maintenance to assure efficient operation. Sewage treatment facilities that have multiple treatment units to treat variable or seasonal loading conditions may shut down redundant treatment units when necessary for efficient operation. The following requirements shall be met during controlled diversions:

- Effluent from the sewage treatment facility shall meet the effluent limitations established in the permit. Wastewater that is diverted around a treatment unit or treatment process during a controlled diversion shall be recombined with wastewater that is not diverted prior to the effluent sampling location and prior to effluent discharge;
- A controlled diversion does not include blending as defined in s. NR 210.03(2e), Wis. Adm. Code, and as may only be approved under s. NR 210.12. A controlled diversion may not occur during periods of excessive flow or other abnormal wastewater characteristics;
- A controlled diversion may not result in a wastewater treatment facility overflow; and
- All instances of controlled diversions shall be documented in sewage treatment facility records and such records shall be available to the department on request.

6.2.9 Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training as required in ch. NR 114, Wis. Adm. Code, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

6.2.10 Operator Certification

The wastewater treatment facility shall be under the direct supervision of a state certified operator. In accordance with s. NR 114.53, Wis. Adm. Code, every WPDES permitted treatment plant shall have a designated operator-in-charge holding a current and valid certificate. The designated operator-in-charge shall be certified at the level and in all subclasses of the treatment plant, except laboratory. Treatment plant owners shall notify the department of any changes in the operator-in-charge within 30 days. Note that s. NR 114.52(22), Wis. Adm. Code, lists types of facilities that are excluded from operator certification requirements (i.e. private sewage systems, pretreatment facilities discharging to public sewers, industrial wastewater treatment that consists solely of land disposal, agricultural digesters and concentrated aquatic production facilities with no biological treatment).

6.3 Sewage Collection Systems

6.3.1 Sanitary Sewage Overflows and Sewage Treatment Facility Overflows

6.3.1.1 Overflows Prohibited

Any overflow or discharge of wastewater from the sewage collection system or at the sewage treatment facility, other than from permitted outfalls, is prohibited. The permittee shall provide information on whether any of the following conditions existed when an overflow occurred:

- The sanitary sewer overflow or sewage treatment facility overflow was unavoidable to prevent loss of life, personal injury or severe property damage;
- There were no feasible alternatives to the sanitary sewer overflow or sewage treatment facility overflow such as the use of auxiliary treatment facilities or adequate back-up equipment, retention of untreated wastes, reduction of inflow and infiltration, or preventative maintenance activities;
- The sanitary sewer overflow or the sewage treatment facility overflow was caused by unusual or severe weather related conditions such as large or successive precipitation events, snowmelt, saturated soil conditions, or severe weather occurring in the area served by the sewage collection system or sewage treatment facility; and
- The sanitary sewer overflow or the sewage treatment facility overflow was unintentional, temporary, and caused by an accident or other factors beyond the reasonable control of the permittee.

6.3.1.2 Permittee Response to Overflows

Whenever a sanitary sewer overflow or sewage treatment facility overflow occurs, the permittee shall take all feasible steps to control or limit the volume of untreated or partially treated wastewater discharged, and terminate the discharge as soon as practicable. Remedial actions, including those in NR 210.21 (3), Wis. Adm. Code, shall be implemented consistent with an emergency response plan developed under the CMOM program.

6.3.1.3 Permittee Reporting

Permittees shall report all sanitary sewer overflows and sewage treatment overflows as follows:

- The permittee shall notify the department by telephone, fax or email as soon as practicable, but no later than 24 hours from the time the permittee becomes aware of the overflow;
- The permittee shall, no later than five days from the time the permittee becomes aware of the overflow, provide to the department the information identified in this paragraph using department form number 3400-184. If an overflow lasts for more than five days, an initial report shall be submitted within 5 days as required in this paragraph and an updated report submitted following cessation of the overflow. At a minimum, the following information shall be included in the report:

  ◦The date and location of the overflow;
  ◦The surface water to which the discharge occurred, if any;
  ◦The duration of the overflow and an estimate of the volume of the overflow;
  ◦A description of the sewer system or treatment facility component from which the discharge occurred such as manhole, lift station, constructed overflow pipe, or crack or other opening in a pipe;
  ◦The estimated date and time when the overflow began and stopped or will be stopped;
  ◦The cause or suspected cause of the overflow including, if appropriate, precipitation, runoff conditions, areas of flooding, soil moisture and other relevant information;
  ◦Steps taken or planned to reduce, eliminate and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
  ◦A description of the actual or potential for human exposure and contact with the wastewater from the overflow;
  ◦Steps taken or planned to mitigate the impacts of the overflow and a schedule of major milestones for those steps;
  ◦To the extent known at the time of reporting, the number and location of building backups caused by excessive flow or other hydraulic constraints in the sewage collection system that occurred

concurrently with the sanitary sewer overflow and that were within the same area of the sewage collection system as the sanitary sewer overflow; and
◦The reason the overflow occurred or explanation of other contributing circumstances that resulted in the overflow event. This includes any information available including whether the overflow was unavoidable to prevent loss of life, personal injury, or severe property damage and whether there were feasible alternatives to the overflow.

NOTE: A copy of form 3400-184 for reporting sanitary sewer overflows and sewage treatment facility overflows may be obtained from the department or accessed on the department's web site at http://dnr.wi.gov/topic/wastewater/SSOreport.html. As indicated on the form, additional information may be submitted to supplement the information required by the form.

- The permittee shall identify each specific location and each day on which a sanitary sewer overflow or sewage treatment facility overflow occurs as a discrete sanitary sewer overflow or sewage treatment facility overflow occurrence. An occurrence may be more than one day if the circumstances causing the sanitary sewer overflow or sewage treatment facility overflow results in a discharge duration of greater than 24 hours. If there is a stop and restart of the overflow at the same location within 24 hours and the overflow is caused by the same circumstance, it may be reported as one occurrence. Sanitary sewer overflow occurrences at a specific location that are separated by more than 24 hours shall be reported as separate occurrences; and
- A permittee that is required to submit wastewater discharge monitoring reports under NR 205.07 (1) (r) shall also report all sanitary sewer overflows and sewage treatment facility overflows on that report.

6.3.1.4 Public Notification

The permittee shall notify the public of any sanitary sewer and sewage treatment facility overflows consistent with its emergency response plan required under the CMOM (Capacity, Management, Operation and Maintenance) section of this permit and s. NR 210.23 (4) (f), Wis. Adm. Code. Such public notification shall occur promptly following any overflow event using the most effective and efficient communications available in the community. At minimum, a daily newspaper of general circulation in the county(s) and municipality whose waters may be affected by the overflow shall be notified by written or electronic communication.

6.3.2 Capacity, Management, Operation and Maintenance (CMOM) Program

- The permittee shall have written documentation of the Capacity, Management, Operation and Maintenance (CMOM) program components in accordance with s. NR 210.23(4), Wis. Adm. Code. Such documentation shall be available for Department review upon request. The Department may request that the permittee provide this documentation or prepare a summary of the permittee's CMOM program at the time of application for reissuance of the WPDES permit.
- The permittee shall implement a CMOM program in accordance with s. NR 210.23, Wis. Adm. Code.
- The permittee shall at least annually conduct a self-audit of activities conducted under the permittee's CMOM program to ensure CMOM components are being implemented as necessary to meet the general standards of s. NR 210.23(3), Wis. Adm. Code.

6.3.3 Sewer Cleaning Debris and Materials

All debris and material removed from cleaning sanitary sewers shall be managed to prevent nuisances, run-off, ground infiltration or prohibited discharges.

- Debris and solid waste shall be dewatered, dried and then disposed of at a licensed solid waste facility.
- Liquid waste from the cleaning and dewatering operations shall be collected and disposed of at a permitted wastewater treatment facility.

- Combination waste including liquid waste along with debris and solid waste may be disposed of at a licensed solid waste facility or wastewater treatment facility willing to accept the waste.

6.4 Surface Water Requirements

6.4.1 Permittee-Determined Limit of Quantitation Incorporated into this Permit

For pollutants with water quality-based effluent limits below the Limit of Quantitation (LOQ) in this permit, the LOQ calculated by the permittee and reported on the Discharge Monitoring Reports (DMRs) is incorporated by reference into this permit. The LOQ shall be reported on the DMRs, shall be the lowest quantifiable level practicable, and shall be no greater than the minimum level (ML) specified in or approved under 40 CFR Part 136 for the pollutant at the time this permit was issued, unless this permit specifies a higher LOQ.

6.4.2 Appropriate Formulas for Effluent Calculations

The permittee shall use the following formulas for calculating effluent results to determine compliance with average concentration limits and mass limits and total load limits:

Weekly/Monthly/Six-Month/Annual Average Concentration = the sum of all daily results for that week/month/six-month/year, divided by the number of results during that time period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Weekly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the week.

Monthly Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the month.

Six-Month Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the six-month period. [Note: When a six-month average effluent limit is specified for Total Phosphorus the applicable periods are May through October and November through April.]

Annual Average Mass Discharge (lbs/day): Daily mass = daily concentration (mg/L) x daily flow (MGD) x 8.34, then average the daily mass values for the entire year.

Total Monthly Discharge: = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.

Total Annual Discharge: = sum of total monthly discharges for the calendar year.

12-Month Rolling Sum of Total Monthly Discharge: = the sum of the most recent 12 consecutive months of Total Monthly Discharges.

6.4.3 Effluent Temperature Requirements

Weekly Average Temperature – The permittee shall use the following formula for calculating effluent results to determine compliance with the weekly average temperature limit (as applicable): Weekly Average Temperature = the sum of all daily maximum results for that week divided by the number of daily maximum results during that time period.

Cold Shock Standard – Water temperatures of the discharge shall be controlled in a manner as to protect fish and aquatic life uses from the deleterious effects of cold shock. 'Cold Shock' means exposure of aquatic organisms to a rapid decrease in temperature and a sustained exposure to low temperature that induces abnormal behavior or physiological performance and may lead to death.

Rate of Temperature Change Standard – Temperature of a water of the state or discharge to a water of the state may not be artificially raised or lowered at such a rate that it causes detrimental health or reproductive effects to fish or aquatic life of the water of the state.

6.4.4 Visible Foam or Floating Solids

There shall be no discharge of floating solids or visible foam in other than trace amounts.

6.4.5 Surface Water Uses and Criteria

In accordance with NR 102.04, Wis. Adm. Code, surface water uses and criteria are established to govern water management decisions. Practices attributable to municipal, industrial, commercial, domestic, agricultural, land development or other activities shall be controlled so that all surface waters including the mixing zone meet the following conditions at all times and under all flow and water level conditions:

a) Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.

b) Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in waters of the state.

c) Materials producing color, odor, taste or unsightliness shall not be present in such amounts as to interfere with public rights in waters of the state.

d) Substances in concentrations or in combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

6.4.6 Percent Removal

During any 30 consecutive days, the average effluent concentrations of BOD_5 and of total suspended solids shall not exceed 15% of the average influent concentrations, respectively. This requirement does not apply to removal of total suspended solids if the permittee operates a lagoon system and has received a variance for suspended solids granted under NR 210.07(2), Wis. Adm. Code.

6.4.7 Fecal Coliform

The monthly limit for fecal coliform shall be expressed as a geometric mean. In calculating the geometric mean, a value of 1 is used for any result of 0.

6.4.8 *E. coli*

The monthly limit for *E. coli* shall be expressed as a geometric mean. In calculating the geometric mean, a value of 1 is used for any result of 0.

6.4.9 Seasonal Disinfection

Disinfection shall be provided from May 1 through September 30 of each year. Monitoring requirements and the limitations for Fecal Coliform (interim) and *E. coli* apply only during the period in which disinfection is required. Whenever chlorine is used for disinfection or other uses, the limitations and monitoring requirements for residual chlorine shall apply. A dechlorination process shall be in operation whenever chlorine is used.

6.4.10 Whole Effluent Toxicity (WET) Monitoring Requirements

In order to determine the potential impact of the discharge on aquatic organisms, static-renewal toxicity tests shall be performed on the effluent in accordance with the procedures specified in the *"State of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition" (PUB-WT-797*, November 2004) as required by NR 219.04, Table A, Wis. Adm. Code). All of the WET tests required in this permit, including any required retests, shall be conducted on the

Ceriodaphnia dubia and fathead minnow species. Receiving water samples shall not be collected from any point in contact with the permittee's mixing zone and every attempt shall be made to avoid contact with any other discharge's mixing zone.

6.4.11 Whole Effluent Toxicity (WET) Identification and Reduction

Within 60 days of a retest which showed positive results, the permittee shall submit a written report to the Biomonitoring Coordinator, Bureau of Water Quality, 101 S. Webster St., PO Box 7921, Madison, WI 53707-7921, which details the following:

- A description of actions the permittee has taken or will take to remove toxicity and to prevent the recurrence of toxicity;

- A description of toxicity reduction evaluation (TRE) investigations that have been or will be done to identify potential sources of toxicity, including some or all of the following actions:

  (a) Evaluate the performance of the treatment system to identify deficiencies contributing to effluent toxicity (e.g., operational problems, chemical additives, incomplete treatment)
  (b) Identify the compound(s) causing toxicity
  (c) Trace the compound(s) causing toxicity to their sources (e.g., industrial, commercial, domestic)
  (d) Evaluate, select, and implement methods or technologies to control effluent toxicity (e.g., in-plant or pretreatment controls, source reduction or removal)

- Where corrective actions including a TRE have not been completed, an expeditious schedule under which corrective actions will be implemented;

- If no actions have been taken, the reason for not taking action.

The permittee may also request approval from the Department to postpone additional retests in order to investigate the source(s) of toxicity. Postponed retests must be completed after toxicity is believed to have been removed.

6.5 Land Application Requirements

6.5.1 Sludge Management Program Standards And Requirements Based Upon Federally Promulgated Regulations

In the event that new federal sludge standards or regulations are promulgated, the permittee shall comply with the new sludge requirements by the dates established in the regulations, if required by federal law, even if the permit has not yet been modified to incorporate the new federal regulations.

6.5.2 General Sludge Management Information

The General Sludge Management Form 3400-48 shall be completed and submitted prior to any significant sludge management changes.

6.5.3 Sludge Samples

All sludge samples shall be collected at a point and in a manner which will yield sample results which are representative of the sludge being tested, and collected at the time which is appropriate for the specific test.

6.5.4 Land Application Characteristic Report

Each report shall consist of a Characteristic Form 3400-49 and Lab Report. The Characteristic Report Form 3400-49 shall be submitted electronically by January 31 following each year of analysis.

Following submittal of the electronic Characteristic Report Form 3400-49, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report is true, accurate and complete. The Lab Report must be sent directly to the facility's DNR sludge representative or basin engineer unless approval for not submitting the lab reports has been given.

The permittee shall use the following convention when reporting sludge monitoring results: Pollutant concentrations less than the limit of detection shall be reported as < (less than) the value of the limit of detection. For example, if a substance is not detected at a detection limit of 1.0 mg/kg, report the pollutant concentration as < 1.0 mg/kg .

All results shall be reported on a dry weight basis.

6.5.5 Calculation of Water Extractable Phosphorus

When sludge analysis for Water Extractable Phosphorus is required by this permit, the permittee shall use the following formula to calculate and report Water Extractable Phosphorus:
Water Extractable Phosphorus (% of Total P) =
[Water Extractable Phosphorus (mg/kg, dry wt) ÷ Total Phosphorus (mg/kg, dry wt)] x 100

6.5.6 Monitoring and Calculating PCB Concentrations in Sludge

When sludge analysis for "PCB, Total Dry Wt" is required by this permit, the PCB concentration in the sludge shall be determined as follows.

Either congener-specific analysis or Aroclor analysis shall be used to determine the PCB concentration. The permittee may determine whether Aroclor or congener specific analysis is performed. Analyses shall be performed in accordance with the following provisions and Table EM in s. NR 219.04, Wis. Adm. Code.

- EPA Method 1668 may be used to test for all PCB congeners. If this method is employed, all PCB congeners shall be delineated. Non-detects shall be treated as zero. The values that are between the limit of detection and the limit of quantitation shall be used when calculating the total value of all congeners. All results shall be added together and the total PCB concentration by dry weight reported. **Note**: It is recognized that a number of the congeners will co-elute with others, so there will not be 209 results to sum.
- EPA Method 8082A shall be used for PCB-Aroclor analysis and may be used for congener specific analysis as well. If congener specific analysis is performed using Method 8082A, the list of congeners tested shall include at least congener numbers 5, 18, 31, 44, 52, 66, 87, 101, 110, 138, 141, 151, 153, 170, 180, 183, 187, and 206 plus any other additional congeners which might be reasonably expected to occur in the particular sample. For either type of analysis, the sample shall be extracted using the Soxhlet extraction (EPA Method 3540C) (or the Soxhlet Dean-Stark modification) or the pressurized fluid extraction (EPA Method 3545A). If Aroclor analysis is performed using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.11 mg/kg as possible. Reporting protocol, consistent with s. NR 106.07(6)(e), should be as follows: If all Aroclors are less than the LOD, then the Total PCB Dry Wt result should be reported as less than the highest LOD. If a single Aroclor is detected then that is what should be reported for the Total PCB result. If multiple Aroclors are detected, they should be summed and reported as Total PCBs. If congener specific analysis is done using Method 8082A, clean up steps of the extract shall be performed as necessary to remove interference and to achieve as close to a limit of detection of 0.003

mg/kg as possible for each congener. If the aforementioned limits of detection cannot be achieved after using the appropriate clean up techniques, a reporting limit that is achievable for the Aroclors or each congener for the sample shall be determined. This reporting limit shall be reported and qualified indicating the presence of an interference. The lab conducting the analysis shall perform as many of the following methods as necessary to remove interference:

3620C – Florisil	3611B - Alumina
3640A - Gel Permeation	3660B - Sulfur Clean Up (using copper shot instead of powder)
3630C - Silica Gel	3665A - Sulfuric Acid Clean Up

6.5.7 Annual Land Application Report

Land Application Report Form 3400-55 shall be submitted electronically by January 31, each year whether or not non-exceptional quality sludge is land applied. Non-exceptional quality sludge is defined in s. NR 204.07(4), Wis. Adm. Code. Following submittal of the electronic Annual Land Application Report Form 3400-55, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

6.5.8 Other Methods of Disposal or Distribution Report

The permittee shall submit electronically the Other Methods of Disposal or Distribution Report Form 3400-52 by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied. Following submittal of the electronic Report Form 3400-52, this form shall be certified electronically via the 'eReport Certify' page by a responsible executive or municipal officer, manager, partner or proprietor as specified in s. 283.37(3), Wis. Stats., or a duly authorized representative of the officer, manager, partner or proprietor that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2, Wis. Adm. Code. The 'eReport Certify' page certifies that the electronic report form is true, accurate and complete.

6.5.9 Approval to Land Apply

Bulk non-exceptional quality sludge as defined in s. NR 204.07(4), Wis. Adm. Code, may not be applied to land without a written approval letter or Form 3400-122 from the Department unless the Permittee has obtained permission from the Department to self approve sites in accordance with s. NR 204.06 (6), Wis. Adm. Code. Analysis of sludge characteristics is required prior to land application. Application on frozen or snow covered ground is restricted to the extent specified in s. NR 204.07(3) (l), Wis. Adm. Code.

6.5.10 Soil Analysis Requirements

Each site requested for approval for land application must have the soil tested prior to use. Each approved site used for land application must subsequently be soil tested such that there is at least one valid soil test in the four years prior to land application. All soil sampling and submittal of information to the testing laboratory shall be done in accordance with UW Extension Bulletin A-2100. The testing shall be done by the UW Soils Lab in Madison or Marshfield, WI or at a lab approved by UW. The test results including the crop recommendations shall be submitted to the DNR contact listed for this permit, as they are available. Application rates shall be determined based on the crop nitrogen recommendations and with consideration for other sources of nitrogen applied to the site.

6.5.11 Land Application Site Evaluation

For non-exceptional quality sludge, as defined in s. NR 204.07(4), Wis. Adm. Code, a Land Application Site Request Form 3400-053 shall be submitted to the Department for the proposed land application site. The Department will

evaluate the proposed site for acceptability and will either approve or deny use of the proposed site. The permittee may obtain permission to approve their own sites in accordance with s. NR 204.06(6), Wis. Adm. Code.

6.5.12 Class B Sludge: Fecal Coliform Limitation

Compliance with the fecal coliform limitation for Class B sludge shall be demonstrated by calculating the geometric mean of at least 7 separate samples. (Note that a Total Solids analysis must be done on each sample). The geometric mean shall be less than 2,000,000 MPN or CFU/g TS. Calculation of the geometric mean can be done using one of the following 2 methods.

Method 1:

Geometric Mean = $(X_1 \times X_2 \times X_3 \ldots \times X_n)^{1/n}$

Where X = Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Method 2:

Geometric Mean = $\text{antilog}[(X_1 + X_2 + X_3 \ldots + X_n) \div n]$

Where X = $\log_{10}$ of Coliform Density value of the sludge sample, and where n = number of samples (at least 7)

Example for Method 2

Sample Number	Coliform Density of Sludge Sample	$\log_{10}$
1	6.0×10^5	5.78
2	4.2×10^6	6.62
3	1.6×10^6	6.20
4	9.0×10^5	5.95
5	4.0×10^5	5.60
6	1.0×10^6	6.00
7	5.1×10^5	5.71

The geometric mean for the seven samples is determined by averaging the $\log_{10}$ values of the coliform density and taking the antilog of that value.

$(5.78 + 6.62 + 6.20 + 5.95 + 5.60 + 6.00 + 5.71) \div 7 = 5.98$

The antilog of $5.98 = 9.5 \times 10^5$

6.5.13 Class B Sludge: Anaerobic Digestion

Treat the sludge in the absence of air for a specific mean cell residence time at a specific temperature. Values for the mean cell residence time and temperature shall be between 15 days at 35° C to 55° C and 60 days at 20° C. Straight-line interpolation to calculate mean cell residence time is allowable when the temperature falls between 35° C and 20° C.

6.5.14 Class B Sludge - Vector Control: Injection

No significant amount of the sewage sludge shall be present on the land surface within one hour after the sludge is injected.

6.5.15 Class B Sludge - Vector Control: Incorporation

Class B sludge shall be incorporated within 6 hours of surface application, or as approved by the Department.

6.5.16 Sludge Hauling

The permittee is required to submit Form 3400-52 to the Department. If sludge is hauled to another facility, information shall include the quantity of sludge hauled, the name, address, phone number, contact person, and permit number of the receiving facility. Form 3400-52 shall be submitted annually by January 31 each year whether or not sludge is hauled.

7 Summary of Reports Due

FOR INFORMATIONAL PURPOSES ONLY

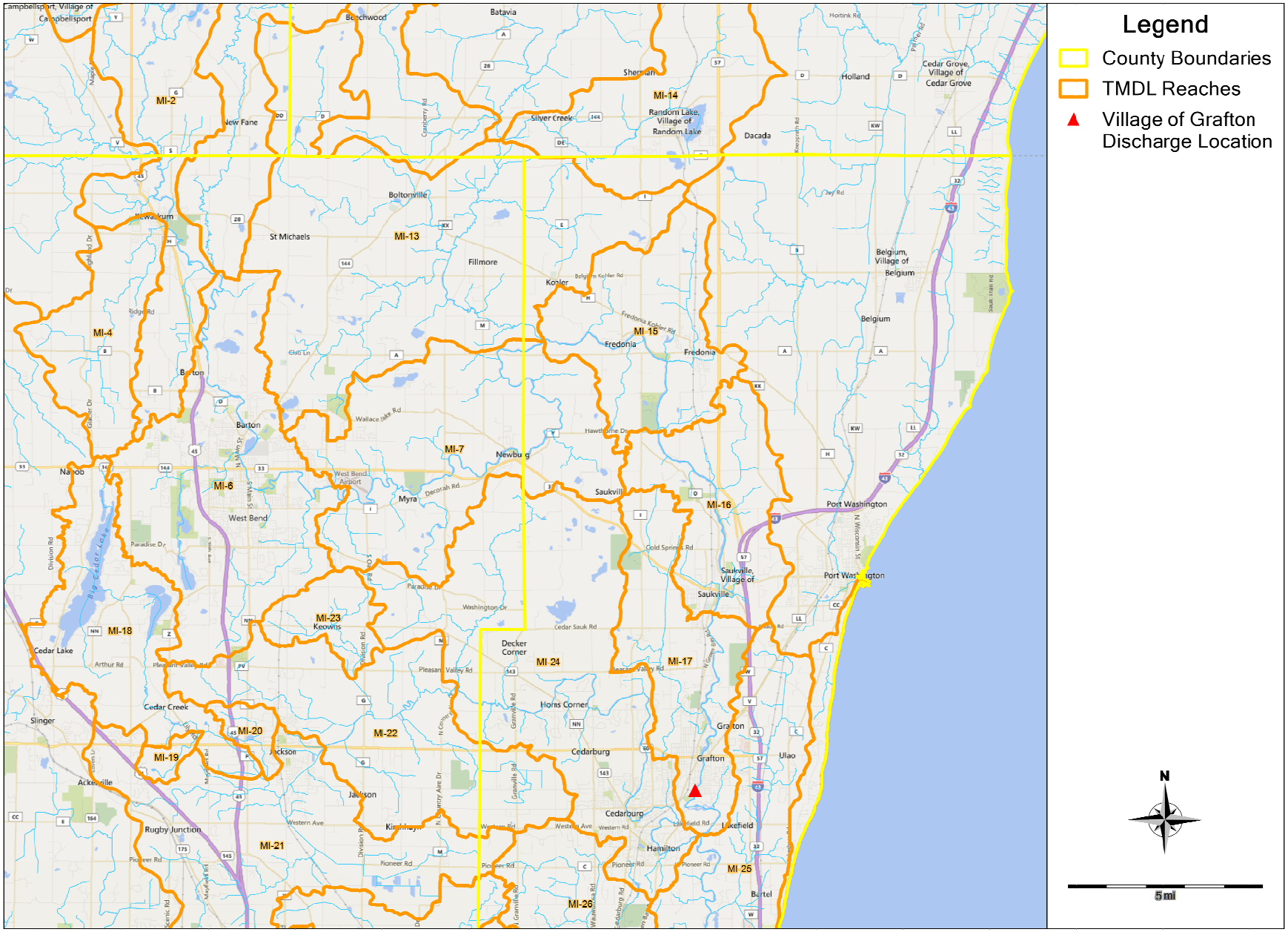
Description	Date	Page
Effluent Limitations for E. coli -Status Update	March 31, 2021	15
Effluent Limitations for E. coli -Operational Evaluation Report	November 30, 2021	15
Effluent Limitations for E. coli -Submit Facility Plan	April 30, 2022	15
Effluent Limitations for E. coli -Final Plans and Specifications	March 31, 2023	15
Effluent Limitations for E. coli -Treatment Plant Upgrade to Meet Limitations	September 30, 2023	16
Effluent Limitations for E. coli -Construction Upgrade Progress Report	September 30, 2024	16
Effluent Limitations for E. coli -Complete Construction	March 31, 2025	16
Effluent Limitations for E. coli -Achieve Compliance	May 1, 2025	16
Adaptive Management Interim Limit Compliance Update -Comply with Adaptive Management Interim Limit	May 1, 2021	16
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report	March 31, 2021	16
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #2	March 31, 2022	16
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #3	March 31, 2023	16
Watershed Adaptive Management Option Annual Report Submittals - Annual Adaptive Management Report #4	March 31, 2024	17
Watershed Adaptive Management Option Annual Report Submittals -Final Adaptive Management Report	March 31, 2025	17
Watershed Adaptive Management Option Annual Report Submittals - Renewal of Adaptive Management Plan for Permit Reissuance	June 30, 2025	17
Watershed Adaptive Management Option Annual Report Submittals - Achieve Water Quality Standards and Adaptive Management Plan Success	January 1, 2026	17
Compliance Maintenance Annual Reports (CMAR)	by June 30, each year	19
General Sludge Management Form 3400-48	prior to any significant sludge management changes	27
Characteristic Form 3400-49 and Lab Report	by January 31 following each year of analysis	28
Land Application Report Form 3400-55	by January 31, each year whether or not non-exceptional quality sludge is land	29

	applied	
Other Methods of Disposal or Distribution Report Form 3400-52	by January 31, each year whether or not sludge is hauled, landfilled, incinerated, or exceptional quality sludge is distributed or land applied	29
Wastewater Discharge Monitoring Report	no later than the date indicated on the form	18

Report forms shall be submitted electronically in accordance with the reporting requirements herein. Any facility plans or plans and specifications for municipal, industrial, industrial pretreatment and non-industrial wastewater systems shall be submitted to the Bureau of Water Quality, P.O. Box 7921, Madison, WI 53707-7921. All other submittals required by this permit shall be submitted to:
Southeast Region - Plymouth, 1155 Pilgrim Road, Plymouth, WI 53073

Appendix B

TMDL Reach Map


Legend
County Boundaries
TMDL Reaches
Village of Grafton Discharge Location
N
5 mi
MI-2
MI-4
MI-6
MI-7
MI-13
MI-14
MI-15
MI-16
MI-17
MI-18
MI-19
MI-20
MI-21
MI-22
MI-23
MI 24
MI 25
MI-26
Batavia
Sherman
Holland
Cedar Grove, Village of Cedar Grove
New Fane
Silver Creek
Random Lake, Village of Random Lake
Dacada
Boltonville
St Michaels
Fillmore
Kohler
Belgium, Village of Belgium
Belgium
Fredonia
Barton
Newburg
Saukville
Port Washington
West Bend
Myra
Saukville, Village of
Keowns
Decker Corner
Horns Corner
Cedar Lake
Cedar Creek
Slinger
Jackson
Cedarburg
Grafton
Ulao
Lakefield
Hamilton
Rugby Junction
Bartel

Appendix C

Quality Assurance and Quality Control Project Plan

PREPARED BY

Mead & Hunt

FINAL

Updated Quality Assurance and Quality Control Project Plan for Adaptive Management River Monitor Program of Total Phosphorus

Village of Grafton, Wisconsin
Document Issued June 2025
Mead & Hunt Project No. R4666713-222121.01

GRAFTON

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APPENDIX A - FIGURES

APPENDIX B -TABLES

APPENDIX C – MISCELLANEOUS

REPORT PREPARED BY

Jon Butt, PE
Mead & Hunt
6737 W Washington Street, Suite 3500
West Allis, WI 53214

1. Project Management

This document has been prepared according to the United States Environmental Protection Agency (U.S. EPA) publication requirements for Quality Assurance Project Plans dated March 2001 (QA/R-5).

1.1 Project/Task Organization

The Village of Grafton, Wisconsin (Grafton) is implementing a program to monitor water quality in the Milwaukee River upstream and downstream of Grafton's wastewater treatment plant (WWTP) as part of Grafton's Adaptive Management (AM) plan to lower the phosphorus concentration within this section of the Milwaukee River to meet water quality standards. The monitoring program will be conducted during the growing season on a yearly. Organizing and implementing the monitoring program is a joint effort between Grafton and its AM plan administrator.

Grafton will be responsible for performing the following activities to collect samples and analyze phosphorus concentrations from two locations in the Milwaukee River:

- Obtain sample bottles before each sample event and arrange for delivery of the samples to Grafton's WWTP laboratory for analysis in accordance with the approved Quality Assurance Project Plan (QAPP).
- Obtain and use any equipment necessary for sample collection and means of transport between sample locations, as necessary.
- Collect the required surface water samples as described in Section 2.0.
- Transport the samples under proper chain-of-custody to the WWTP laboratory for analysis.
- Analyze the samples for the parameters described in Section 1.3, following the procedures included in Appendix C.
- Record the data collected during each sampling event in an electronic format compatible with Microsoft Office 365 software or equivalent.

The AM plan administrator will be responsible for the following activities:

- Prepare a QAPP for the water quality monitoring program.
- Analyze the resultant data and provide Grafton with an annual letter report that describes the results of the monitoring program.

Grafton will provide sampling personnel who will collect the required samples. The field technician will be responsible for equipment preparation, sample collection, and sample transportation.

All Grafton WWTP laboratory personnel will be responsible for the laboratory analysis and maintenance of their internal quality assurance/quality control (QA/QC) procedures (Appendix C).

1.2 Problem Definition/Background

Grafton owns a WWTP that discharges to the Milwaukee River. Discharges from the WWTP must comply with a Wisconsin Pollution Discharge Elimination System (WPDES) permit that requires Grafton to reduce phosphorus discharges to the Milwaukee River to meet water quality regulations. Grafton chose to implement an AM plan to restore the in-river total phosphorus concentrations to water quality standards at the most downstream location of the AM planning action area. The action area is the Milwaukee River total maximum daily load (TMDL) reach MI-17 shown on Figure 3 in Appendix A.

The monitoring program will benchmark total phosphorus concentrations flowing into and discharging from the action area. This monitoring program will help estimate phosphorus concentration in the river and quantify reductions achieved by various phosphorus runoff-reducing practices.

1.3 Project/Task Description

A map showing the proposed monitoring locations is included in Figure 2 in Appendix A. Section 2 of this report further identifies each sample location site. All sample locations will be georeferenced using global positioning system (GPS) technology.

The parameter listed below will be analyzed monthly during the growing season at normal flow conditions as defined by the United States Geological Survey (USGS) at Flow Monitoring Station 04086600.

- Total Phosphorus

Sample collection and analysis add to the data set of river phosphorus concentration values, which will quantify the impact that phosphorus reduction practices have on river total phosphorus concentrations and will be used to determine the success of the AM program.

1.4 Data Quality Objectives

Data quality objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support decisions made during the project and are based on the end uses of the data to be collected. As such, different data uses may require different levels of data quality. There are five analytical levels, which address various data uses and the QA/QC effort and methods required to achieve the desired level of quality. These levels are as follows:

Screening (DQO Level 1) | This level provides the lowest data quality but the most rapid results. It is often used for health and safety monitoring at the site, initial site characterization to locate areas for subsequent and more accurate analyses, and engineering screening of alternatives. These types of data include those generated on site using pH, dissolved oxygen (DO), ORP, temperature, and specific conductance probes, as well as other real-time monitoring equipment at the site.

Field Analysis (DQO Level 2) | This level provides rapid results and better quality than DQO Level 1. This level may include mobile laboratory-generated data, depending on the level of quality control exercised.

Engineering (DQO Level 3) | This level provides an intermediate level of data quality and is used for site characterization. Engineering analyses may include mobile laboratory-generated data and some analytical laboratory methods (e.g., laboratory data with quick turnaround used for screening but without full quality control documentation).

Confirmational (DQO Level 4) | This level provides the highest level of data quality and is used for purposes of risk assessment and evaluation of remedial alternatives.

Non-Standard (DQO Level 5) | This level refers to analyses by non-standard protocols (e.g., when exacting detection limits or analysis of an unusual chemical compound is required). These analyses often require method development or adaptation. The level of quality control is usually similar to DQO Level 4 data.

The analytical data generated by the phosphorus monitoring activities for the Milwaukee River will be DQO Level 4.

1.5 Quality Assurance Objectives For Measurement Data

The overall quality assurance objective of this project is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide results that are legally defensible in a court of law. The purpose of this section is to address the specific objectives for completeness, representativeness, and comparability.

1.5.1 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the total data obtained over the course of the project. Site access, sampling protocol problems, analytical problems, and the data validation process can all contribute to missing or suspect data. It is expected that the data will meet QA/QC acceptance criteria for 95% or more for all samples tested. If the completeness objective is not met, actions will be taken to improve performance. This may take the form of an audit to evaluate the methodology and procedures used as possible sources for the difficulty, and/or may result in the recommendation of a different method.

1.5.2 Representativeness

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Representativeness is a qualitative parameter that is dependent upon the proper design of the sampling program and proper laboratory protocol. The sampling network was designed to provide data representative of site conditions. The rationale for the sampling locations is discussed in Section 2.1.1 of this report and Table 2 of Appendix B. Representativeness will be satisfied by ensuring that the proper sampling techniques are used, proper analytical procedures are followed, and holding times of the samples are not exceeded in the laboratory. Representativeness will be assessed by the analysis of field duplicated samples.

1.5.3 Comparability

Comparability expresses the confidence with which one set of data can be compared with another. It can be related to precision and accuracy, as these quantities measure data reliability.

Quantitatively, data subjected to strict QA/QC procedures will be deemed more reliable than other data. Field data will be obtained following a given procedure and reported in consistent units to allow for easy comparisons.

1.6 Documents and Records

Sampling collection records, field notebooks, and all records of field activities shall be retained by the Grafton for 5 years. Sample collection records shall document the proper sampling protocol performed in the field. In addition, the Project Managers, defined in Table 1 of Appendix B, shall retain all laboratory analytical results and all laboratory correspondence associated with the project. Chain-of-custody forms submitted to the laboratory will also be retained along with the analytical results. Grafton's Project Manager and the Mead & Hunt Project Manager, defined in Table 1 of Appendix B, shall be made aware of any problems encountered during any phase of the project.

Grafton shall retain copies of all management reports and memoranda.

2. Data Generation and Acquisition

2.1 Sampling Process Design

The following section discusses the sampling process design.

2.1.1 Site Identification and Sampling Rationale

Data sampling stations are shown in Figure 2. Sample location sites were selected according to the following criteria:

Site 1 | Determines the total phosphorus concentration of the Milwaukee River flowing into the action area.

Site 2 | Determines the total phosphorus concentration of the Milwaukee River that is exiting the action area. This is the critical sample location for compliance.

Additional sampling stations may be added or removed based on data evaluation by the AM plan administrator.

2.1.2 Sampling Frequency

Samples will be collected monthly during the growing season and under typical flow conditions as determined by USGS. The growing season is defined as May through October. USGS defines normal flow conditions as flow between the 25th and 75th percentiles of flow over the last 30 years or more. USGS Station 04086600 will be used to monitor flow. This station has over 40 years of flow records.

Samples will only be collected when conditions are safe. Sample collection will be postponed when unsafe conditions exist, such as high flow or storms. Grafton plans to collect one sample during each month of the growing season. A minimum of 30 days will lapse between sample collections. A total of six representative samples, one for each month of the growing season, will be reported by Grafton, along with the median value of the six data points. The median value will be used to determine compliance of the river with the water quality standards. All data will be included in the annual report that will be provided to the Wisconsin Department of Natural Resources (WDNR).

2.2 Sampling Methods

Surface water grab samples will be collected at the locations specified in Section 2.1.1 of this report. Water quality samples will be collected from each location using the direct method or the Kemmerer bottle method. Sample bottles will be filled, labeled, and packed on ice. A clean pair of latex gloves will be worn for each water quality sample collected by the sampling team. All samples will be delivered to and/or picked up by the laboratory with sufficient time to meet holding times.

2.3 Sample Handling and Custody

The collected samples will be labeled appropriately, placed in coolers, and stored on ice at approximately 4 °C immediately after collection and kept on ice during transport to or pick up by the laboratory within the prescribed holding times. The technician for each sampling event will coordinate sample delivery to the laboratory. Samples will be delivered to or released to a representative of the laboratory defined under the chain-of-custody procedures within 24 hours of collection. Preservatives, if necessary, will be provided in the containers provided by the laboratory. A table in appendix B describes field collection containers, preservation, and holding times.

When received by the laboratory, the samples will be logged into the laboratory logbook and/or laboratory database. Maximum holding times before analysis, as stated in applicable laboratory method standard operating procedures (SOPs), provided in Appendix C, will be followed.

2.4 Analytical Methods

The laboratory's data analysis methods will be U.S. EPA-approved methods listed in 40 CFR Part 136. Table 3 describes holding times as established in 40 CFR Part 136 and the detection limits of the Graton WWTP laboratory to be used in this study.

2.5 Level of Quality Control Effort

QA/QC procedures are necessary both in the field and in the laboratory to ensure that the data collected in environmental monitoring programs are of known quality, useful, and reliable. QA/QC procedures can be divided into two categories: field QA/QC procedures and laboratory QA/QC procedures.

2.5.1 Field Quality Control

All field personnel will be responsible for ensuring that proper sampling methods, sample preservation, and sample custody of the delivered samples to the designated laboratory are followed. Refer to Appendix C for additional sample collection and field procedures.

In the event of a quality control or noncompliance issue, the Mead & Hunt Project Manager will prepare an investigation and corrective action report. The Project Manager will then forward this report to the Mead & Hunt Project quality assurance officer. The accuracy and precision of all data measurements must be quantifiable. Analytical procedures used for data analysis must be performed according to approved standard methods. Data measurements should be recorded in a controlled environment in which a quality control program can be maintained.

2.5.2 Laboratory Quality Control

Laboratory QA/QC procedures ensure analyses of known and documented quality through instrument calibration and the processing of samples. Precision of laboratory findings refers to the reproducibility of results. In a laboratory QA/QC program, a sample is independently analyzed more than once, using the same methods and set of conditions. The precision is estimated by the variability between repeated measurements. Accuracy refers to the degree of difference between observed values and known or true values. The accuracy of a method may be determined by analyzing samples to which known amounts of reference standards have been added.

The laboratory is responsible for the accuracy and reliability of analytical methods and final data reports according to its QA/QC manual. The Mead & Hunt Project Manager will work closely with the Laboratory Project Manager to implement QA/QC procedures in accordance with the QAPP in Appendix C.

A failure of an internal QA/QC limit will result in an investigation and a corrective action report by the Laboratory Project Manager. A copy of the corrective action report will be submitted to the Project Managers (Grafton and Mead & Hunt) and will be filed by date. Samples that have failed any QA/QC limit will be retested, if possible. The laboratory will maintain the QA/QC records for the analytical runs for the samples of interest.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance

All laboratory equipment will be routinely maintained according to the manufacturer's manuals. Any equipment used for field data measurements will be tested, calibrated, and inspected prior to sampling events and after it returns from the field.

2.7 Instrument Calibration and Frequency

Instruments used in the laboratory will be calibrated prior to use according to the manufacturer's manual. The laboratory shall calibrate instruments according to the internal QA/QC manual and SOPs. The laboratory shall also keep adequate records of equipment calibration and use U.S. National Institute of Standards and Technology (NIST) traceable standards when possible.

2.8 Instrument Calibration and Frequency

The field teams will inspect supplies and consumables used in the field to guarantee their usability. Laboratory managers will inspect supplies and consumables used in laboratory procedures to confirm compliance with laboratory QA/QC manuals and SOPs.

2.9 Non direct Measurements

Non-direct measurements will not be obtained for the project.

2.10 Data Management

Grafton's Project Managers shall maintain field books, field measurement records, and other data gathered in the field for 5 years in project files. The laboratory will convey all laboratory analytical data to the Project Managers (Grafton & Mead & Hunt) in the laboratory's standard report form.

3. Assessment and Oversight

3.1 Assessment and Response Actions

Grafton's Project Manager will conduct performance evaluations of the sampling teams. The evaluations will document whether the sampling protocol is followed. The project Manager will also investigate quality control and noncompliance issues related to field activities and develop a corrective action plan.

The WWTP laboratory performing data analysis shall maintain internal quality assurance programs as described in their quality assurance plans. Most laboratories maintain quality control checks for procedures. When the possibility of quality control problems or noncompliance issues arises that may affect the usability of data, Grafton's Project Manager will submit an investigation and corrective action report.

In addition, Grafton's Project Manager shall make certain that the project data associated with any quality control or other nonconformance issue is made available to data users with the appropriate data qualification. When data previously released to data users may have been affected by a quality control problem or other nonconformance issue, the Project Manager shall notify other data users of the problem.

3.2 Assessment and Response Actions

Grafton's Project Manager will receive investigation and corrective action reports in case of any quality control or noncompliance issues. Any quality assurance problems affecting the final reported values shall be reported to all data users.

4. Data Validation and Usability

4.1 Data Review, Validation, and Verification Requirements

The Project Managers (Grafton & Mead and Hunt) will review final analytical data reports and address any issues related to data reliability as mentioned in pertinent investigation and corrective action plans. Qualified laboratory data will be listed as such in any reports or data submitted. The quality assurance

objectives, including methods of analysis, matrix precision percentage, matrix accuracy percentage, laboratory control sample (LCS) accuracy percentage, method detection limit (MDL), quality limit (QL), and laboratory information management system (LIMS) for various parameters, are included as Appendix C.

4.2 Verification and Validation Methods

Field technicians shall verify sample collection and field measurement records, which shall be kept by Grafton's Project Manager(s). The Project Manager shall also verify laboratory data. Each project Manager shall archive field and laboratory records.

If data verification results in a change to data, the Project Manager will inform all data users and make corrections.

If data accuracy, reliability, or usability has been reduced due to errors in stored data or corrupted data files, the project manager will be informed. All data users shall be notified of the problems and corrections made.

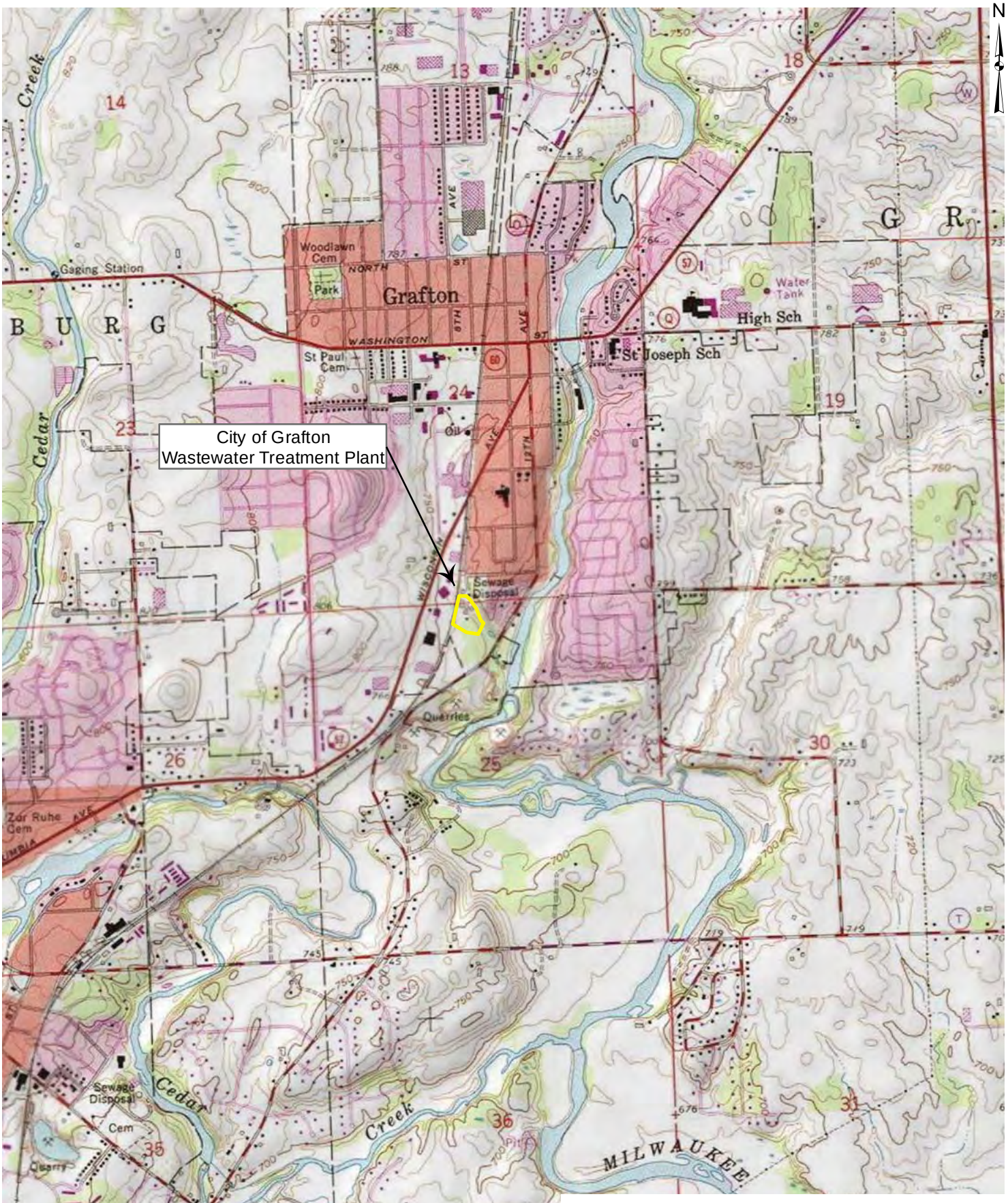
4.3 Reconciliation with User Requirements

The project's execution shall follow the procedures outlined in this QAPP. Grafton personnel and the AM plan administrator are responsible for implementing quality control measures during each stage of the project.

The QAPP shall be reviewed annually by Grafton's project team. The review shall determine issues to be addressed as the project progresses. Issues to be discussed may include:

- The number and location of sampling stations.
- The frequency of sampling.
- Sampling procedures.
- Parameters measured.
- Data-quality objectives and minimum measurement criteria.
- Analytical procedures.
- Project reporting.
- Corrective actions taken.

The Grafton Project Manager will modify and approve the QAPP. Grafton Project will keep a separate record of any changes.



Legend

Wastewater Treatment Plant Boundary

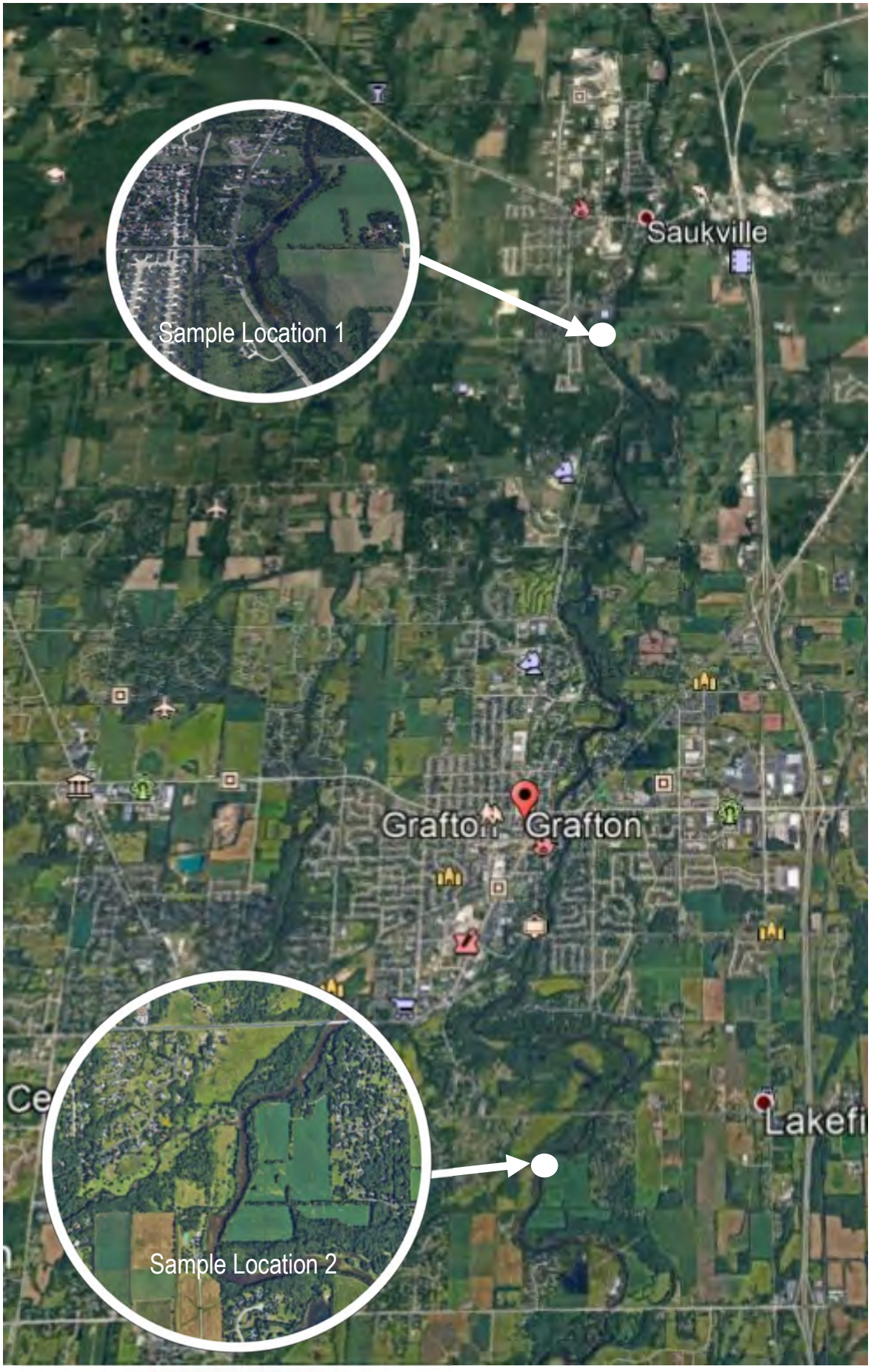
SYMBIONT
6737 West Washington Street
Suite 3440
West Allis, Wisconsin 53214
P: 414.291.8840
F: 414.291.8841

DSGN:	CHK:	
DR: MJM	APVD:	
G:\Projects\City of Grafton\Map Documents\1.mxd		

City of Grafton
Wastewater Treatment Plant

Figure 1
Site Location and Local Topography

SCALE 1 inch = 2,000 feet
DWG
DATE April 2012
PROJ NO.


Sample Location 1
Saukville
Grafton
Grafton
Sample Location 2

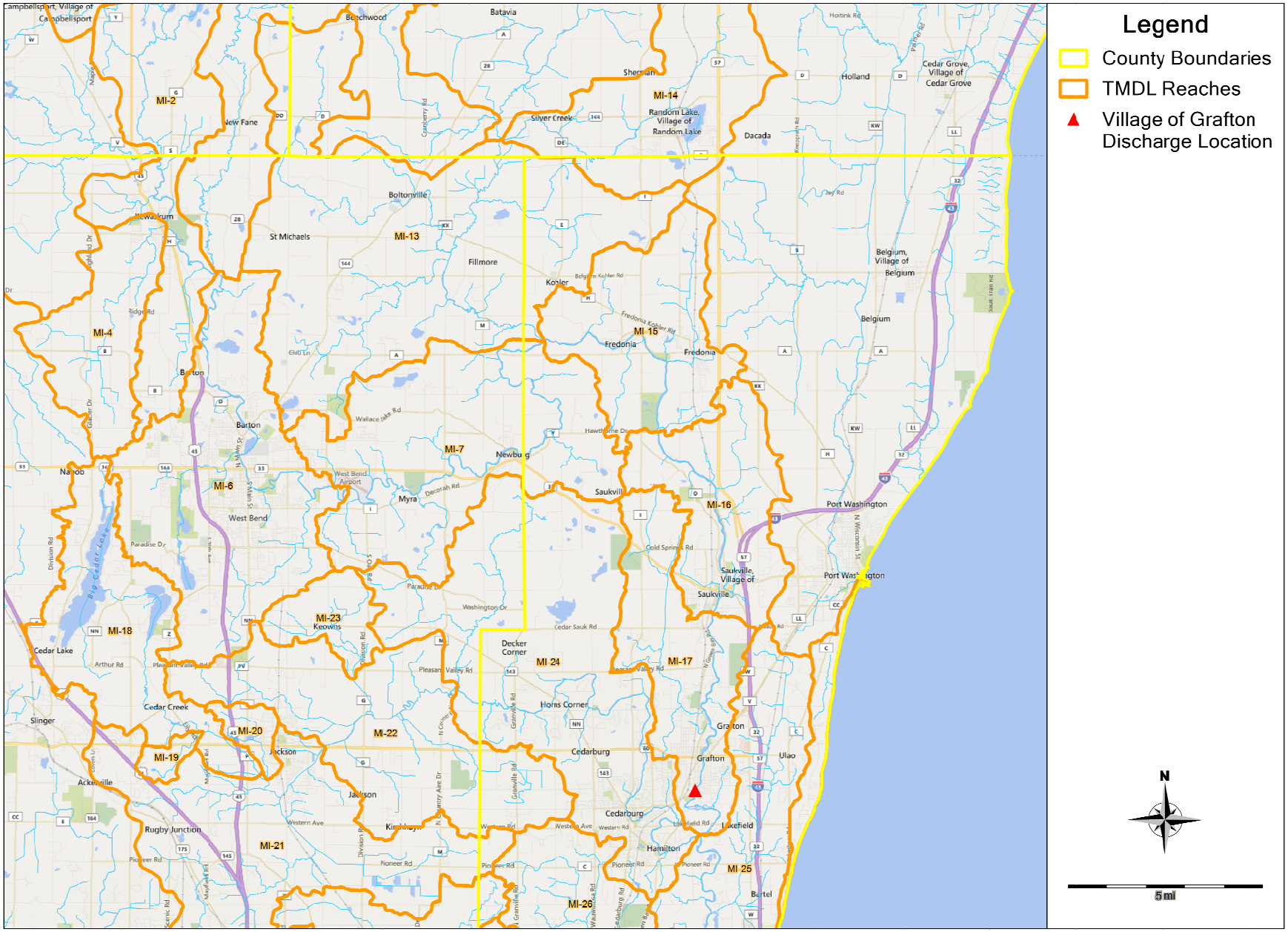

Legend
County Boundaries
TMDL Reaches
Village of Grafton Discharge Location
N
5 mi
MI-2
MI-4
MI-6
MI-7
MI-13
MI-14
MI-15
MI-16
MI-17
MI-18
MI-19
MI-20
MI-21
MI-22
MI-23
MI 24
MI 25
MI-26
Batavia
Sherman
Holland
Cedar Grove, Village of Cedar Grove
New Fane
Silver Creek
Random Lake, Village of Random Lake
Dacada
Boltonville
St Michaels
Fillmore
Kohler
Belgium, Village of Belgium
Belgium
Fredonia
Barton
Newburg
Saukville
Port Washington
West Bend
Myra
Saukville, Village of
Keowns
Decker Corner
Horns Corner
Cedar Lake
Cedar Creek
Slinger
Jackson
Cedarburg
Grafton
Ulao
Lakefield
Hamilton
Rugby Junction
Bartel

TABLE 1. PROJECT PERSONNEL

Entity	Project Role	Staff
Mead & Hunt	Project Manager	Jonathan R. Butt
	Project Quality Assurance Officer Regulatory Interface	Patrick W. Carnahan
	Sampling and Analysis Plan	Jonathan R. Butt
	Data Analysis Report Preparation	Jonathan R. Butt
Village of Grafton	Project Manager	Erik Olsen
	Project Advisor	Brecken Gries
Village of Grafton WWTP Laboratory	Technicians	Erik Olsen Zachary Schermer

TABLE 2. SAMPLING LOCATIONS

Sample Type	Label for Type of Sample	Sample Location No.	Sample Description	River Stage	Sampling frequency	Sample Name
Surface Water		**-1**	Determines the total phosphorus concentration of the Milwaukee River flowing into the action area.	**Normal flow conditions defined as 25% to 75% of the measured flow through USGS monitoring station 04086600 over the last 30 years.**	**One (1) sample collected each month starting in May and extending through October. A minimum of 30 days to lapse between sample collection.**	**1**
Surface Water		**2**	Determines the total phosphorus concentration of the Milwaukee River that is exiting the action area.			**2**

*Sample locations will be georeferenced using GPS technology.

Note: Sample location 2 in this revised QAPP corresponds to sample location 4 in the previous QAPP.

TABLE 3. SAMPLE CONTAINER, FIELD PRESERVATION, HOLDING TIME AND DETECTION LIMITS

Parameter	Container and Preservation[1]	Holding Time[2]	Detection Limits/Accuracy
Total phosphorus	1L plastic bottle, H_2SO_4 to pH<2, chill with ice	28 days, Refrigerate	0.087 mg/L

Notes:
mg/L = milligrams per liter
L = Liter
H_2SO_4 = sulfuric acid
°C = degrees Celsius
+/- = plus and/or minus

1. All preservatives if necessary come in the containers provided by the laboratory.
   * After preservatives, if necessary, are added.

2. Holding time is defined as from time and date of collection to time and date of analysis.

The State of Wisconsin
Department of Natural Resources

has granted

Accreditation under NR 149

to

Grafton Wastewater Treatment Plant

FID: 246003010

The laboratory is accredited to perform environmental sample analysis in support of covered environmental programs per matrix for the combination of analyte and technology or analyte and method as specified in the attached Scopes of Accreditation.

Printed on: August 08, 2024

Expires on: August 31, 2025

Zana Sijan, Manager
Certification Services

This certificate does not guarantee validity of data generated, but indicates the methodology, equipment, quality control practices, records, and proficiency of the laboratory have been reviewed and found to satisfy the requirements of chapter NR 149, Wisconsin Administrative Code.

Wisconsin Scope of Accreditation

Laboratory FID: 246003010
REGISTRATION
Aqueous (Non-potable Water)

Grafton Wastewater Treatment Plant
1900 9th Ave.
Grafton, WI 53024

Printed on: **8/8/2024**
Expires on: **8/31/2025**

Oxygen Demand Assays (BOD or cBOD)	**Biochemical Oxygen Demand (BOD)**
Colorimetric or Turbidimetric	**Phosphorus, Total**
Electrometric Assays (ISE)	**Ammonia as N**
Gravimetric Assays - Residue (solids)	**Residue, Nonfilterable (TSS)**
Titrimetric or Potentiometric Titration Assays	**Chloride**

TITLE:	**Hach Method (10209 / 10210) – Spectrophotometric Measurement of Total P**
ANALYTE:	**Total Phosphorus**
FACILITY:	**Village of Grafton**
REFERENCE METHOD:	**EPA 365.3**
DATE OF ISSUE:	**8/30/23**

1.0 Applicable Matrices

1.1 This method is applicable to drinking water, surface and saline waters, and domestic and industrial wastes matrices.

2.0 Summary of the Test Method

2.1 Ammonium molybdate and antimony potassium tartrate react in an acid medium with dilute solutions of phosphorus to form an antimony-phospho-molybdate complex. This complex is reduced to an intensely blue-colored complex by ascorbic acid. The color is proportional to the phosphorus concentration and is measured at 650 or 880 ± 5 nm.

2.2 Only orthophosphate forms a blue color in this test. Polyphosphate (and some organic phosphorus compounds) many be converted to the orthophosphate form by sulfuric acid hydrolysis. Organic phosphorus compounds may be converted to the orthophosphate form by persulfate digestion.

3.0 Safety

3.1 Proper personal protection equipment, such as a lab coat, safety glasses, and nitrile gloves should be worn when performing any laboratory test.

3.2 When using acid solutions, wear appropriate protective clothing: rubber apron, protective sleeves, gloves, and safety goggles or glasses.

3.3 Always have adequate ventilation when working with acids, bases, and solvents to minimize exposure to vapors.

3.4 Refer to the Safety Data Sheet for information on a specific chemical.

4.0 Equipment and Supplies

4.1 Spectrophotometer, DR 3900 for use at 880 nm

4.2 COD Reactor block capable of heating to 150°C for 30 Min.

4.3 Class A pipets or verified mechanical pipettors

4.4 Acid-rinsed glassware: graduated cylinders and 50 mL volumetric flasks

4.5 Test tube rack

4.6 pH paper, narrow range (0 – 6.0); used to confirm pH of <2 for preservation

4.7 pH paper, narrow range (5.5 – 8.0); used to confirm preserved samples are neutralized to 6.0 to 8.0

5.0 Reagents and Standards

5.1 Distilled water

5.2 Hach Company TNTplus Phosphorus Kit, TNT 843 low range tubes for effluent samples, and TNT 845 high range tubes for influent samples.

5.3 Phosphate stock standard, 5 mg/L as P (TNT 843) as well as 50 mg/l as P (TNT 845). This solution expires according to manufacturer's expiration date. Note: use standards "as P" instead of "as PO4."

5.4 ICV (initial calibration verification standard), second source phosphate stock standard, 1000 mg/L as P diluted to 5 mg/l (TNT 845) and 50 mg/l as P diluted to 1 mg/l (HACH 843). This solution expires according to manufacturer's expiration date.

5.5 CCV (continuing calibration verification standard)/LCS (lab control standard) phosphate solution, HACH 845 use 5 mg/l. Hach 843 use 1 mg/l.

5.6 Sulfuric acid solution, 5 N (for preserving samples)

5.7 Sodium hydroxide solution, 5 N (for neutralizing preserved samples)

5.8 Proficiency Testing samples by an approved provider

6.0 Interferences

6.1 There are no interferences caused by copper, iron, or silicate at concentrations many times greater than their reported concentration in seawater. However, high iron concentrations can cause precipitation of and subsequent loss of phosphorus.

6.2 The salt error for samples ranging from 5 to 20% salt content was found to be less than 1%.

6.3 Arsenate is determined similarly to phosphorus and should be considered when present in concentrations higher than phosphorus. However, at concentrations found in seawater, it does not interfere.

7.0 Sample Collection, Preservation, and Storage

7.1 Resistant-glass or plastic bottles may be used for sample collection. Containers should be cleaned with a non-phosphate detergent and water, and rinsed thoroughly with tap water. Bottles should then be rinsed with 1% hydrochloric acid (HCl) and followed by tap water and deionized or distilled water.

7.2 If samples cannot be analyzed within 15 minutes of collection, samples must be preserved by acidifying with sulfuric acid (H_2SO_4) to a pH <2 immediately after collecting.

7.2.1. Generally, 2.0 mL's of 5 N H_2SO_4 per 1 L of sample is sufficient to reduce the pH to <2.

7.2.2. Samples must be tested periodically (at least quarterly) with narrow range pH paper (0-6 pH) to confirm the pH is <2 and documented on the bench sheet or on a separate log.

7.3 Store the preserved samples at ≤6°C.

7.4 Hold times may not exceed 28 days from the time of collection.

8.0 Quality Control

8.1 Initial Quality Control

8.1.1. All analysts shall perform an IDC once for each lab technician. An IDC is required of all new lab technicians.

8.2 Initial and On-going Quality Control

8.2.1. Method Detection Limit (MDL): every thirteen months, calculate and verify the MDL. See the "Method Detection Limits and Reporting" section.

8.2.2. Calibrate the spectrophotometer annually or whenever the calibration check verification (CCV) standard fails (see "Calibration and Standardization" section).

8.2.3. Verify the calibration immediately following the calibration curve by analyzing an initial calibration verification (ICV) standard. The ICV must be from a second source standard.

8.2.4. Annually a Proficiency Testing (PT) sample must be obtained and analyzed from one of the Wisconsin DNR approved providers.

8.3 On-going Quality Control

8.3.1. Verify the calibration on non-calibration days with each analysis and before any samples or other QC by analyzing a continuing calibration verification (CCV) standard. Also run a CCV after every batch of 20 samples.

8.3.2. Analyze a method blank (MB) every run of 20 samples after the ICV or CCV. Note: if a batch of 20 samples contains two different lot numbers of vials, run a method blank with each lot number.

8.3.3. Analyze a laboratory control sample (LCS) with every run of 20 samples. (If the calibration standards are processed the same as samples and the CCV, the LCS will be the same as the CCV; in this case, a separate LCS does not need to be analyzed.) Note: if a batch of 20 samples contains two different lot numbers of vials, run a CCV/LCS with each lot number.

9.0 Calibration and Standardization

9.1 The Hach DR 3900 spectrophotometer is used. Refer to the User Manual for additional information.

9.2 Calibration must be performed at least annually or whenever the ICV or CCV fails. (The pre-programmed vendor calibration must not be used.)

9.3 The linear calibration curve must be generated with a calibration blank and at least 3 standards.

9.4 Prepare the calibration standards from the 50 mg/L phosphorus stock standard (TNT 845) and 5 mg/l (TNT 843). Mix solution's in 50 ml Beaker.

9.5 HACH TNT 845 Curve as follows.

Standard Concentration (mg/L)	Volume of 50 mg/L standard (mL)	Final total volume (mL)	Calibration standard final concentration (mg/L as P)
50	0	50	0
50	2	50	2.0
50	4	50	4.0
50	6	50	6.0
50	8	50	8.0
50	10	50	10.0

HACH TNT 843 Curve as follows

Standard Concentration (mg/L)	Volume of 5 mg/L standard (mL)	Final total volume (mL)	Calibration standard final concentration (mg/L as P)
5	0	50	0
5	2	50	.2
5	4	50	.4
5	6	50	.6
5	8	50	.8
5	10	50	1.0
5	12	50	1.2

9.6 Follow the "Procedure" section for digesting all of the calibration standards just as samples are digested.

9.7 Alternatively, use the WI DNR supplied spreadsheet to record all absorbances and calculate calibration results.

9.8 The calibration r-value must be ≥0.995. If not, re-calibrate.

9.9 Document all of the calibration results and information on the bench sheet.

10.0 Procedure

10.1 Turn on the COD reactor block and heat to 150°C. Refer to the User Manual for instructions on temperature programs or temperature adjustments.

10.2 If the samples were preserved with acid, neutralize to a pH of about 7 with 5 N sodium hydroxide solution. Use either a pH meter or pH paper.

10.2.1. The amount of 5 N sodium hydroxide will be about the same as the amount of 5 N sulfuric acid used to preserve the sample.

10.2.2. Correct the test result for the amount of acid and base used if the addition represents more than 2% of the total sample volume.

10.3 Warm all samples and reagents to room temperature.

10.4 Label all vials that will be needed including vials for QC samples with fine permanent marker.

10.5 Remove the DosiCap™ Zip from the vial and remove the aluminum foil seal.

10.6 Pipet 2 mL (if TNT843) / 0.4 mL (if TNT845) of samples and QC samples to the appropriate labeled vials.

10.7 Attach the DosiCap Zip (reagent side down) to the vial.

10.8 Shake to mix until the reagent in the DosiCap Zip has dissolved.

10.9 Verify the temperature of the COD reactor reached 150°C, and record the temperature on the bench sheet.

10.10 Set a timer and heat the vials for 30 minutes in the COD reactor at 150°C.

10.11 Remove the vials from the reactor immediately after 30 minutes, and allow the vials to cool to room temperature.

10.12 Turn on the spectrophotometer, and press the program # (make sure the wavelength is set to 880 nm).

10.13 Zero the spectrophotometer with a vial containing only distilled water (this is the instrument blank). Insert the vial, close the cover, and press "ZERO" to zero the meter.

10.14 Remove and discard the DosiCap Zip, and add 0.2 mL of Reagent B to the vial.

10.15 Attach the DosiCap from Bottle C.

10.16 Shake to mix until the reagent in the DosiCap Zip has dissolved.

10.17 Set the timer for 10 minutes. Try to be consistent for all samples.

10.18 After the timer goes off, wipe the outside of the vial, insert into the meter and record the absorbance reading on the phosphorus bench sheet.

10.18.1. To see the absorbance reading, press "shift ABS," then "READ."

10.19 Insert each vial into the meter, push "READ," and record absorbance.

10.20 If any sample has an absorbance reading higher than the highest standard in the calibration curve, the sample must be diluted and reanalyzed.

11.0 Calculations

11.1 Results are calculated from the linear calibration curve (y = mx + b) generated by the lab. Include any applicable dilution factors. The WDNR supplied spreadsheet may be used to do all calculations.

11.2 Report results as mg/L P.

12.0 Method Detection Limits and Reporting

12.1 This method has an applicable range from the LOD (about 0.05) to 1.50 mg/L P if using TNT843 or if using TNT845 from the LOD (about 0.5) to 5.0 mg/L P. All samples with absorbances above the absorbance of the highest calibration standard must be diluted. The lowest value that can be reported is no lower than the MDL: report as less than (<) the MDL value.

12.2 The MDL must be less than the permit limit.

12.3 The MDL is calculated annually by following the EPA 40 CFR Part 136 Appendix B protocol.

12.3.1. All method blanks associated with reported results are entered into the WDNR supplied spreadsheet.

12.3.2. Two spiked blanks are analyzed each quarter and entered into the WDNR supplied spreadsheet.

13.0 QC Data Assessment, Acceptance Criteria, and Corrective Actions and Contingencies for Out-of-Control QC Measures

13.1 Quality control samples summary:

QC Test	Criteria
Calibration curve	r≥0.995
ICV	90 – 110% true value
Method Blank	≤ Highest of: LOD, 5% permit limit, or 10% sample conc'n
CCV/LCS	90 – 110% true value

13.2 If the calibration curve does not have an r value ≥0.995, recalibrate. Corrective actions may also include preparing new calibration standards.

13.3 If the ICV is not 90-110% of the true value, re-make the ICV solution and reanalyze. If the ICV still does not pass, re-calibrate.

13.4 If the method blank is not ≤LOD (or 5% of the permit limit or 10% sample concentration), reanalyze. If it is still out of range, qualify the data.

13.5 If the CCV/LCS is not 90-110% of the true value, take corrective action such as re-make the CCV/LCS solution and reanalyze. If the CCV still does not pass, re-calibrate.

13.6 Qualify all sample results with method blank or CCV/LCS exceedances on the bench sheet and the eDMR.

13.6.1. Samples that fail the Quality Control will have to be qualified back to the last date that the quality control met the above conditions. Include a lab comment on the DMR.

13.7 The Proficiency Testing (PT) sample must be within the criteria of the provider. If the criteria limits are not met, the technician must immediately order another sample to be analyzed.

13.8 For any of the above items or if there are any other obvious errors or deviations from the standard operating conditions, complete the Corrective Actions Log and resolve the problem. Notify the Supervisor.

13.8.1. If results are unacceptable, take appropriate corrective action. This may include acid washing all containers, checking the water source, checking expiration dates, and documenting any changes or adjustments made.

13.8.2. Complete the Corrective Actions in the log sheets. Enter in all information as completely as possible, even if the short-term reasons for failures are not clear.

13.8.3. Seek help from an outside source if specific QC issues cannot be resolved. These sources may be another lab, the Wisconsin Rural Water Association wastewater trainer, or the facility's lab auditor.

14.0 Pollution Prevention

14.1 Consider environmental impact when purchasing materials, handling chemicals, and disposing of wastes.

14.2 Prevent pollution at the source whenever possible.

15.0 Waste Management

15.1 All laboratory waste, excess reagents, and samples must be disposed of in a manner that is consistent with applicable rules and regulations.

16.0 References

16.1 Standard Methods for the Examination of Water and Wastewater, Method 4500-P E, 1999.

16.2 Hach Company TNTplus™ Phosphorus – Spectrophotometric Measurement of Phosphorus in Water and Wastewater, Method 10209/10210, Revision 2, Hach Company, 2015.

17.0 Disclaimer:

17.1 The mentioning of company or product names does not constitute endorsement by the Wisconsin Department of Natural Resources or the authors.

Appendix D

Stakeholders Letters of Support

OZAUKEE COUNTY
LAND & WATER MANAGEMENT DEPARTMENT

Katie Vogeler, Director
Edward J. Pfister, Sanitation & Zoning Coordinator
Geoff Schramm, Land & Water Coordinator

June 25, 2025

To: Department of Natural Resources

From: Katie Vogeler, Director
Ozaukee County Land & Water Management

Re: Partnering with the Village of Grafton in an Adaptive Management Program to Reduce Phosphorus in the Milwaukee River Watershed.

Ozaukee County has a strong history of conservation work to reduce phosphorus runoff. The County's partnership with the Village of Grafton in this Adaptive Management Program has strengthened the conservation work implemented within the watershed.

Projects include, but are not limited to, living and green cover crops, and reducing tillage, that improve soil health and result in increased water infiltration and less runoff. Village of Grafton, and their Adaptive Management Coordinator, Steve Hoffmann, are motivated to continue this soil health collaboration, and Ozaukee County is in full support.

Yours in Conservation,

Katelyn Vogeler
Director, Ozaukee County Land & Water Management
kvogeler@ozaukeecounty.gov
262-284-8279

June 26, 2025

As an independent crop consultant and nutrient management planner working with farmers in Eastern Wisconsin, I fully support the renewal of the Village of Grafton's Phosphorus Adaptive Management Plan. I know first-hand that this option is fostering outreach to farms that has resulted in changes to tillage, cover crops and nutrient management practices. This option encourages agronomists and farmers to think more critically about the surface water quality implications of agricultural practices.

I strongly believe that the Grafton Phosphorus Adaptive Management Plan is fostering changes in farming practices that will reduce phosphorus delivery to surface water. It is my personal goal to help reduce phosphorus delivery from agriculture to the point that stream, river and lake water quality goals are achieved.

Highest regards,

Steve Hoffman

Steven A. Hoffman, CPAg, CPCC-I

InDepth Agronomy | 8426 Borgwardt Lane | Manitowoc, WI 54220

www.InDepthAgronomy.com

Appendix E

15-Year Flow Records from United States Geological Survey Monitoring Stations

Flow Calculations

The following table contains the annual flow data for the Milwaukee River and Cedar Creek for the most recent 15 year period (2009 through 2024).

	Annual Average Flow (CFS) as reported by USGS		
	Milwaukee	Cedar	Grafton AM
Year	River	Creek	Action Area
2009	534.9	104.5	430.4
2010	537.6	118.6	419
2011	539.3	121.6	417.7
2012	382.3	88.3	294
2013	642.6	159.4	483.2
2014	609.1	109.3	499.8
2015	377.3	75.9	301.4
2016	613.2	107	506.2
2017	695.6	155.8	539.8
2018	567.4	140.5	426.9
2019	759.6	165.5	594.1
2020	971.1	183.1	788
2021	459.6	83.2	376.4
2022	436.2	100.7	335.5
2023	488.3	133.5	354.8
2024	683.9	152.7	531.2
Average			456.2 cfs

The estimated annual flow through the AM action area to determined by subtracting the Cedar Creek flow from the Milwaukee River flow.

The values shown in this table are in CFS.

The records obtained from the USGS flow monitoring stations are attached.

The statistics generated from this site are based on approved daily-mean data and may not match those published by the USGS in official publications. The user is responsible for assessment and use of statistics from this site. For more details on why the statistics may not match, click here.

USGS 04086600 MILWAUKEE RIVER NEAR CEDARBURG, WI

Available data for this site Time-series: Annual statistics GO

Ozaukee County, Wisconsin
Hydrologic Unit Code 04040003
Latitude 43°16'49", Longitude 87°56'33" NAD83
Drainage area 607 square miles
Gage datum 653.31 feet above NAVD88

Output formats

HTML table of all data
Tab-separated data
Reselect output format

Water Year	00060, Discharge, cubic feet per second
Period-of-record for statistical calculation restricted by user	
2009	534.9
2010	537.6
2011	539.3
2012	382.3
2013	642.6
2014	609.1
2015	377.3
2016	613.2
2017	695.6
2018	567.4
2019	759.6
2020	971.1
2021	459.6
2022	436.2
2023	488.3
2024	683.9

The statistics generated from this site are based on approved daily-mean data and may not match those published by the USGS in official publications. The user is responsible for assessment and use of statistics from this site. For more details on why the statistics may not match, click here.

USGS 04086500 CEDAR CREEK NEAR CEDARBURG, WI

Available data for this site Time-series: Annual statistics GO

Ozaukee County, Wisconsin
Hydrologic Unit Code 04040003
Latitude 43°19'23", Longitude 87°58'43" NAD83
Drainage area 120 square miles
Gage datum 795.42 feet above NAVD88

Output formats

HTML table of all data
Tab-separated data
Reselect output format

Water Year	00060, Discharge, cubic feet per second
Period-of-record for statistical calculation restricted by user	
2009	104.5
2010	118.6
2011	121.6
2012	88.3
2013	159.4
2014	109.3
2015	75.9
2016	107
2017	155.8
2018	140.5
2019	165.5
2020	183.1
2021	83.2
2022	100.7
2023	133.5
2024	152.7

Appendix F

2020 Utility Capital Plan & Wastewater Budget

PROPRIETARY FUNDS
WATER AND WASTEWATER UTILITIES
BUDGET SUMMARY

		2022 12/31/2022 Actual	2023 12/31/2023 Actual	1/1/2022 2024 12/31/2024 Adopted	2024 12/31/2024 Estimated	2025 12/31/2025 Requested
	Water Revenue	1,983,917	2,074,179	2,028,616	2,080,002	2,127,793
	Wastewater Revenue	3,885,970	4,027,025	3,885,551	4,070,610	4,190,368
Total Operating Revenue		5,869,888	6,101,204	5,914,167	6,150,612	6,318,161
Operating Expenses						
	Water Expenses	1,671,769	1,939,479	2,051,588	2,087,841	2,235,709
	Wastewater Expenses	2,505,918	2,528,244	2,834,201	2,923,256	3,189,032
Total Operating Expenses		4,177,688	4,467,723	4,885,789	5,011,097	5,424,741
Net Operating Income		1,692,200	1,633,481	1,028,378	1,139,515	893,420
Non-Operating Income (Expense)						
605.46.447401	Other Revenue - Water	4,701	4,138	6,271	4,000	4,000
610.46.447402	Other Revenue - Sewer	27,357	23,737	34,044	20,000	20,000
605.46.441501	Merchandise & Jobbing - Water	0	0	500	0	500
610.46.441502	Merchandise & Jobbing - Sewer	50	0	500	0	500
605.46.441901	Interest Income - Water	(22,446)	78,476	52,500	150,000	75,000
610.46.441902	Interest Income - Sewer	(24,185)	108,074	64,250	134,882	34,250
605.46.442101	Capital Contribution - Water	54,275	1,361,348	224,682	613,081	625,000
610.46.442102	Capital Contribution - Sewer	62,314	887,381	124,982	562,000	575,250
610.46.442112	Erc Contributions	121,154	93,708	83,200	134,500	142,100
605.46.442001	Gain (Loss) on Sale of Assets - Water	(9,173)	(2,924)	17,500	13,000	17,500
610.46.442002	Gain (Loss) on Sale of Assets - Sewer	14,000	(154,023)	17,500	13,000	17,500
605.443011.992	Interest Expense - Water	(17,502)	(43,413)	(93,195)	(93,195)	(131,104)
610.443022.992	Interest Expense - Sewer	(256,414)	(306,916)	(383,903)	(383,902)	(360,662)
605.442811.697	Debt Amortization Expense - Water	(3,267)	(782)	(3,867)	(9,020)	(9,020)
610.442822.697	Debt Amortization Expense - Sewer	16,611	21,382	19,423	29,013	29,013
605.443021.993	Debt Issuance Costs - Water	0	(33,690)	(35,000)	(38,805)	(39,000)
610.443022.993	Debt Issuance Costs Sewer	0	(64,396)	(50,000)	(28,995)	(29,000)
610.443102.993	Transfer To General Fund	(60,213)	(60,213)	(60,213)	(60,213)	(60,213)
Total Non-Operating R/E		(92,738)	1,911,889	19,174	1,059,346	911,614
Net Income		1,599,462	3,545,369	1,047,552	2,198,861	1,805,034
NET POSITION - Beginning Year		42,957,971	44,557,433	45,925,935	48,102,802	50,301,663
NET POSITION - Ending Year		44,557,433	48,102,802	46,973,487	50,301,663	52,106,697
	Non Operating Water Revenue	27,356	1,441,038	301,453	780,081	722,000
	Non Operating Sewer Revenu	200,689	958,877	324,476	864,382	789,600
	Non operating Water Expense	(20,769)	(77,884)	(132,062)	(141,020)	(179,124)
	Non operating Sewer Expense	(300,015)	(410,142)	(474,693)	(444,097)	(420,862)
	Total Non Operating	(92,738)	1,911,889	19,174	1,059,346	911,614

PROPRIETARY FUNDS
Wastewater Utility
610.000000

Operating Revenues		2022 Actual	2023 Actual	2024 Adopted	2024 Estimated	2025 Requested
610.46.546212	Sales - Residential	2,628,777	2,765,658	2,645,599	2,809,417	2,870,259
610.46.546222	Sales - Commercial	670,924	595,812	651,029	590,804	605,179
610.46.546232	Sales - Industrial	180,823	177,630	178,137	157,121	159,911
610.46.546242	Sales - Public Authority	45,755	49,217	45,468	52,561	86,640
610.46.546152	Sales - Multi-Family	216,827	284,764	229,488	306,260	312,479
	Total Metered Sales	3,743,107	3,873,082	3,749,721	3,916,163	4,034,468
610.46.546262	Septage Receipts	123,064	134,852	119,048	135,200	137,900
610.46.546312	Forfeited Discounts	17,183	16,876	13,682	16,627	16,000
610.46.547402	Other Revenue-Sewer	2,618	2,215	3,100	2,620	2,000
	Total Other Revenues	142,864	153,943	135,830	154,447	155,900
	Total Operating Revenues	3,885,970	4,027,025	3,885,551	4,070,610	4,190,368
Operating Expenses						
	Operation	503,813	558,648	589,630	639,153	689,395
	Maintenance	465,844	439,719	548,791	523,526	594,812
	Customer Accounts	7,387	9,368	9,280	9,892	9,810
	Administration & General	420,515	386,277	533,770	587,904	705,764
		1,397,558	1,394,012	1,681,471	1,760,475	1,999,781
610.440322.898	Depreciation Expense	1,072,856	1,096,494	1,113,103	1,120,653	1,143,066
610.440812.130	Fica Taxes	26,307	27,858	27,627	32,356	36,569
610.440812.417	Joint Metering	9,197	9,880	12,000	9,772	9,616
		1,108,360	1,134,232	1,152,730	1,162,781	1,189,251
	Total Operating Expense	2,505,918	2,528,244	2,834,201	2,923,256	3,189,032
Net Operating Income		1,380,052	1,498,781	1,051,350	1,147,354	1,001,336
	Personnel	348,564	379,361	367,127	421,814	454,055
	Operating	2,157,354	2,148,884	2,467,074	2,501,442	2,734,977
	Total Operating Expense	2,505,918	2,528,244	2,834,201	2,923,256	3,189,032
OPERATION EXPENSES						
	Personnel					
610.682002.110	Salaries & Wages	88,275	97,187	93,575	113,725	118,750
610.682002.115	Part Time Wages	344	0	0	0	0
610.682002.127	Overtime	8,510	9,185	9,811	8,600	8,860
610.682002.129	Longevity	80	98	116	116	134
Total Personnel - Operation Labor		97,209	106,469	103,502	122,441	127,744
	Operating Services					
610.682102.225	Utilities	58,409	68,282	61,350	76,359	80,177
610.682402.343	Chemicals - Phosphorus Removal	18,228	29,031	36,000	36,000	39,600
610.682502.343	Chemicals - Sludge Condit	13,838	12,915	14,050	14,050	15,455
610.682602.343	Chemicals	0	0	0	0	5,000
610.682702.219	Contract Svcs - Grit Removal	13,115	16,945	15,300	17,200	17,550
610.682702.319	Supplies & Expenses	41,274	47,208	65,450	47,491	65,450
610.682702.393	Uniform Allowance	4,273	4,926	5,280	5,760	6,000
610.682712.225	Utilities - Wwtp Electric	124,047	137,354	118,700	147,533	154,910
610.682722.225	Utilities - Wwtp Gas	25,376	18,697	25,100	22,472	23,596
610.682732.210	Contractual Services	72,069	80,377	97,030	102,580	104,650
610.682742.210	Contractual Services	4,240	4,362	4,960	5,087	5,190
610.682742.319	Supplies & Expenses-Regulatory	11,011	10,841	11,245	11,215	11,440
610.682762.319	Supplies & Expenses-Safety Eqp	3,980	6,946	8,080	9,220	12,680
610.682762.330	Training & Conferences	1,517	0	3,473	1,043	293
Total Operating - Treatment Plant		391,376	437,884	466,018	496,010	541,991
	Personnel					
610.682802.110	Salaries & Wages	47	146	260	100	110
610.682802.115	Part-Time Wages	0	59	0	0	0
Total Personnel - Transportation		47	205	260	100	110
	Operating Services					
610.682802.242	Vehicle Maintenance	2,165	2,986	7,750	7,750	7,750
610.682802.319	Supplies & Expenses	1,114	530	1,200	2,252	1,200
610.682802.342	Fluids	11,901	10,575	10,900	10,600	10,600
Total Operating - Transportation		15,181	14,091	19,850	20,602	19,550
	TOTAL OPERATION EXPENSES	503,813	558,648	589,630	639,153	689,395

PROPRIETARY FUNDS
Wastewater Utility
610.000000

Account Number	2022 Actual	2023 Actual	2024 Adopted	2024 Estimated	2025 Requested
MAINTENANCE EXPENSES					
Personnel					
610.683002.110 Salaries & Wages	6,978	2,832	3,498	31,190	32,250
Total Personnel - Maintenance of Meters	6,978	2,832	3,498	31,190	32,250
Operating Services					
610.683002.319 Supplies & Expenses	4,068	0	600	300	600
Total Operating - Maintenance of Meters	4,068	0	600	300	600
Personnel					
610.683102.110 Salaries & Wages	8,045	15,585	1,595	12,550	18,250
610.683102.115 Part-Time Wages	44	61	0	0	0
610.683102.127 Overtime	86	84	79	350	400
Total Personnel - Sewage Collection System	8,175	15,730	1,674	12,900	18,650
Operating Services					
610.683102.210 Contractual Services	90,640	32,759	60,000	60,000	60,000
610.683102.319 Supplies & Expenses	27,505	26,435	52,265	44,196	42,955
Total Operating - Sewage Collection System	118,145	59,194	112,265	104,196	102,955
Personnel					
610.683202.110 Salaries & Wages	58,781	53,155	54,230	47,623	56,135
610.683202.115 Part Time Wages	15	0	1,590	0	0
610.683202.127 Overtime	8,678	7,614	7,070	6,960	7,100
610.683202.129 Longevity	27	0	94	94	121
Total Personnel - Collection Systems Pumping Equipment	67,500	60,769	62,984	54,677	63,356
Operating Services					
610.683202.210 Contractual Services	29,198	25,291	21,800	23,335	14,550
610.683202.319 Supplies & Expenses	34,975	15,202	7,025	8,876	3,625
Total Operating - Collection Systems Pumping Equipment	64,173	40,492	28,825	32,211	18,175
Personnel					
610.683302.110 Salaries & Wages	61,057	70,392	75,300	71,100	73,500
610.683302.115 Part-Time Wages	1,141	0	0	0	0
610.683302.127 Overtime	514	1,565	1,030	1,300	1,350
610.683302.129 Longevity	104	122	176	168	204
Total Personnel - WWTP Equipment	62,815	72,078	76,506	72,568	75,054
Operating Services					
610.683302.210 Contractual Services	20,804	14,005	4,600	4,600	4,000
610.683302.319 Supplies & Expenses	29,069	66,600	99,800	97,860	119,500
Total Operating - WWTP Equipment	49,873	80,605	104,400	102,460	123,500
Personnel					
610.683402.110 Salaries & Wages	16,026	38,028	29,000	41,432	41,020
610.683402.115 Part-Time Wages	10,727	10,208	9,165	7,440	14,375
610.683402.127 Overtime	0	444	7,802	510	600
Total Personnel - General Plant Maintenance	26,753	48,680	45,967	49,382	55,995
Operating Services					
610.683402.210 Contractual Services	26,304	23,329	33,300	36,615	30,965
610.683402.319 Supplies & Expenses	19,449	22,572	60,300	18,907	55,700
Total Operating - General Plant Maintenance	45,752	45,901	93,600	55,522	86,665
Operating Services					
610.683412.240 Equipment Repair & Maint	8,564	5,499	6,000	8,120	5,140
610.683412.319 Supplies & Expenses	3,047	7,938	12,472	0	12,472
Total Operating - Computers	11,611	13,437	18,472	8,120	17,612
TOTAL MAINTENANCE EXPENSES	465,844	439,719	548,791	523,526	594,812

PROPRIETARY FUNDS
Wastewater Utility
610.000000

Account Number		2022 Actual	2023 Actual	2024 Adopted	2024 Estimated	2025 Requested
683102.210	Contractual Services					
	Emergency Pumping	0	0	5,000	5,000	5,000
	Misc Repairs	56,574	873	0	0	0
	Pipe Inspections and cleaning	2,312	0	0	0	0
	Root Control	0	0	5,000	5,000	5,000
	Sewer Televising	31,754	31,887	50,000	50,000	50,000
		90,640	32,759	60,000	60,000	60,000
683202.210	Contractual Services					
	Generator Preventive Maintenance	2,527	5,295	3,500	3,500	2,600
	Impeller Replacement (Bridge Street)	4,114	0	0	0	0
	Level Probe Replacement 17th Ave	19,168	9,115	0	0	0
	Level Probe Replacement Green Bay Ave	0	1,239	0	0	0
	Lift Station Maintenance	1,962	0	10,300	11,835	11,950
	Lift Station Operator Interface Replacement 11th	0	4,550	0	0	0
	Pump Preventive Maintenance	0	4,000	0	0	0
	Miscellaneous Repair Costs	1,427	1,092	0	0	0
	Sealcoat Lift Stations & Well Pumphouses	0	0	8,000	8,000	0
		29,198	25,291	21,800	23,335	14,550
683302.210	Contractual Services					
	Boiler Sludge Replace and Comb Check	377	0	0	0	0
	Boiler Parts & Service	1,906	0	4,600	4,600	4,000
	Compressed Air Pumping	0	7,100	0	0	0
	Facility Electrical Additions	0	6,500	0	0	0
	Miscellaneous	0	405	0	0	0
	Pump Replacement	12,472	0	0	0	0
	Sludge Boiler Heath Tube Cleaning	6,049	0	0	0	0
		20,804	14,005	4,600	4,600	4,000
683402.210	Contractual Services					
	Asphalt Seal Coating	12,225	0	0	0	0
	Boiler, Jet Vac & Skid Loader M&R and PM	377	600	2,700	1,500	0
	Computer consulting	0	0	0	0	0
	Computers	0	0	0	0	0
	Crane Inspection	0	725	1,550	800	900
	Entrance Gate Maintenance/Rehab	0	0	250	250	250
	Excavator Repairs	1,241	82	0	0	0
	Facility Repair	0	0	0	0	0
	Fire Ext. Inspection and Service	2,227	3,025	1,530	2,265	2,300
	Garage/Door Preventive Maintenance	0	0	750	1,400	1,400
	Generator Maintenance/Service	2,861	4,393	4,700	4,300	4,700
	HVAC Service Contract/PM	1,250	2,175	2,550	2,250	2,400
	Janitorial Service	2,550	2,550	650	2,569	2,665
	Jet-Vac Preventative Maintenance	0	0	5,000	1,000	5,000
	Jet-Vac Truck Repairs	0	2,965	2,500	1,961	2,000
	Locker & Boiler Room Floor Recoating	0	0	0	0	0
	Miscellaneous	0	0	3,950	2,700	0
	Office Building Wifi Installation	1,048	0	0	0	0
	Paint Digestor Hallway	0	0	0	0	0
	Paint Lunchroom Hallway	0	0	0	0	0
	Pressure Washer Service	0	0	0	300	300
	Security System Maintenance	1,557	5,634	6,000	12,000	6,000
	Shop Ventilation	0	1,180	0	0	0
	Sprinkler System Inspections	400	0	420	1,550	1,550
	UTV Maintenance	0	0	-	0	750
	Wheel Loader Tires/Maintenance	0	0	750	1,770	750
	WIFI	567	0	0	0	0
		26,303	23,328	33,300	36,615	30,965

PROPRIETARY FUNDS
Wastewater Utility
610.000000

Account Number		2022 Actual	2023 Actual	2024 Adopted	2024 Estimated	2025 Requested
CUSTOMER ACCOUNT EXPENSES						
	Personnel					
610.684002.110	Salaries & Wages	0	361	0	0	0
610.684002.115	Part-Time Wages	52	0	0	0	0
Total Personnel - Billing, Collection and Accounting		52	361	0	0	0
	Operating Services					
610.684012.311	Postage	3,200	3,495	8,880	9,252	9,280
610.684012.319	Supplies & Expenses	3,313	5,330	400	530	530
Total Operating - Billing, Collection and Accounting		6,514	8,825	9,280	9,782	9,810
	Personnel					
610.684202.110	Salaries & Wages	822	181	0	110	0
Total Personnel - Meter Reading		822	181	0	110	0
	TOTAL CUSTOMER ACCOUNT EXPENSES	7,387	9,368	9,280	9,892	9,810
ADMINISTRATION AND GENERAL EXPENSES						
	Administration and General					
	Personnel					
610.685002.110	Salaries & Wages	78,203	71,679	72,550	77,100	79,225
610.685002.127	Overtime	0	342	40	1,200	1,500
610.685002.129	Longevity	10	34	146	146	171
Total Personnel - Administrative and General		78,214	72,055	72,736	78,446	80,896
	Operating Services					
610.685102.220	Communications	3,749	3,990	5,525	3,913	3,940
610.685102.311	Postage	2,317	2,816	2,620	2,452	3,040
610.685102.319	Supplies & Expenses	5,071	5,354	3,815	6,078	2,560
610.685102.335	Local Auto Expenses	0	0	150	0	0
610.685202.210	Contractual Services	187,910	172,494	275,917	309,883	417,584
610.685312.510	Property Insurance	42,060	37,128	38,986	42,443	38,986
610.685322.510	Liability Insurance	6,032	5,100	3,000	2,928	3,000
610.685332.510	Vehicle Insurance	9,266	1,980	1,937	4,884	1,937
610.685342.510	Insurance - Workers Comp	18,052	9,486	9,205	8,104	13,471
610.685402.132	Insurance - Health	45,975	60,078	94,856	94,856	103,084
610.685402.136	Insurance - Life	219	468	613	620	660
610.685402.130	Pension Expense	(1,897)	(10,458)	(9,000)	0	0
610.685402.131	Wisconsin Retirement	19,225	20,738	24,590	28,547	25,956
610.685602.319	Supplies & Expenses	1,272	667	1,200	1,050	1,050
610.685602.325	Books, Subscriptions, Dues	259	62	195	120	195
610.685602.330	Training & Conferences	2,791	4,319	7,425	3,580	9,405
Total Operating - Administration and General		342,301	314,222	461,034	509,458	624,868
	TOTAL ADMINISTRATION AND GENERAL EXPENSES	420,515	386,277	533,770	587,904	705,764

PROPRIETARY FUNDS
Wastewater Utility
610.000000

Account Number		2022 Actual	2023 Actual	2024 Adopted	2024 Estimated	2025 Requested
685202.210	Contractual Services					
	Adaptive Management/Farm Practice Imprvmts	68,674	86,308	80,000	58,000	80,000
	Administrative Services	45,100	28,124	34,951	34,128	35,193
	AMI Hosting Fee	6,781	6,984	7,200	7,194	7,300
	Audit	11,845	12,250	13,500	12,000	16,000
	Billing Contractor	20,500	23,315	22,200	22,200	22,200
	Caselle Software Support	5,208	6,269	6,582	5,394	5,663
	Community Rivers Program	1,875	1,875	1,875	1,875	1,875
	Consultant Engineering	0	0	7,500	3,500	7,500
	Debt Issuance Costs	950	713	250	0	0
	Driveway Repairs after WWW repair	12,900	0	0	0	0
	Enginering for Pump Upgrades	0	0	0	67,000	130,000
	ESRI Subscriptions	0	0	0	517	517
	GIS Support/Maintenance	0	244	175	175	180
	GIS Survey	13,690	0	0	0	0
	GIS Updates	1,665	0	7,750	8,000	7,750
	I&I Study (BSLS)	18,630	0	0	0	0
	Legal Expenses	313	656	2,600	248	1,000
	Microsoft Licensing	1,429	0	0	0	0
	Phosphorus Plan Admin/Field Monitoring	0	0	77,500	58,500	77,500
	Pump Repairs	2,289	0	0	0	0
	Rate Study	0	0	0	12,480	2,500
	Software Annual Support	800	1,400	0	0	0
	SCADA Miscellaneous	0	0	1,000	500	1,000
	Scanning - As Builts	0	0	1,750	0	0
	Technology Support/Anitvirus	1,042	1,122	3,298	2,162	2,195
	Televising	(28,860)	0	0	0	0
	VPN Services	0	0	3,786	0	0
	Web Hosting	3,080	3,234	4,000	4,010	4,211
	WPDES Permit Renewal Application	0	0	0	0	15,000
	WWTP Odor Study	0	0	0	12,000	0
		187,911	172,494	275,917	309,883	417,584

Appendix G

Annual Adaptive Management Report December 2025

PREPARED BY

Mead & Hunt

GRAFTON
QUALITY LIFE, NATURALLY.

Annual Adaptive Management Report

Project Number R4666713-222121.01
Final Report Issued December 2025

CONTENTS

TABLES

APPENDIX

REPORT PREPARED BY:

Jon Butt, PE
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1. Introduction

The Village of Grafton (Grafton) is implementing a watershed management plan, commonly referred to as adaptive management (AM), to achieve compliance with the phosphorus mass allocations found in the Grafton's Wisconsin Pollution Discharge Elimination System (WPDES) permit. This AM Plan aims to reduce the total phosphorus concentration in the Milwaukee River to below the water quality standard at the pour point for the action area. The current water quality standard is 0.075 mg/L.

This annual report contains a summary of the actions taken by Grafton in the previous crop year, actions planned by Grafton in the coming year, results from monitoring in-river phosphorus concentrations within the action area, progress made toward reaching the goal of the plan, and any changes being recommended to the plan.

2. Previous Year's Activities

The 2025 annual report was implemented in accordance with changes to the AM Plan as indicated in the 2024 report. The change involved removing any phosphorus reductions associated with the Grafton's MS4 permit from the AM Plan. As a result, the 2025 year's activities focused on agricultural phosphorus target reductions found in Section 2.4 of the approved AM Plan located throughout the action area and upstream from the action area, along with maintaining optimization for phosphorus removal at the Grafton's wastewater treatment plant.

The following summarizes the Grafton's actions throughout the previous year to reduce phosphorus.

Area 1 | Improvements Along the Milwaukee River Impacting Reach MI-17

Area 1 was removed from the AM Plan.

Area 2 | Agricultural Improvements Within Reaches MI-16 and MI-17

Grafton continued its program to support cover crops and no-till agricultural practices in the Milwaukee River watershed. Grafton did not set a goal for the 2024/2025 crop year. Grafton expanded support from six farmers in the 2023/2024 crop year to seven farmers in the 2024/2025 crop year. The acreage supported by Grafton decreased from 3,730.7 acres to 3,682.7. The estimated reduction in phosphorus runoff increased from 3,987 lbs per year to 5,001 lbs per year.

The Appendix includes summaries of the SnapPlus modeling output for the fields from the seven farms.

Area 3 | Improvements to the Village's Wastewater Treatment Plant

No improvements to the Grafton's wastewater treatment plant occurred over the preceding year. Any further improvements to it would involve significant capital expense and fall outside of the AM program. It is not likely that further optimization of the wastewater treatment plant is possible.
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3. Upcoming Year's Activities

A summary of the village's upcoming plan can be found in the Renewal of Adaptive Management Plan for WPDES Permit Reissuance report on agricultural reductions by supporting best management practices. The following is a summary of actions the Village plans to begin throughout the upcoming year to reduce phosphorus.

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4. Results From Milwaukee River Monitoring

Grafton collected samples from the Milwaukee River at the four monitoring locations identified within the Appendix of the AM Plan. Those four locations are:

Site 1: Determines the total phosphorus concentration of the Milwaukee River flowing into the action area.

Site 2: Determines the total phosphorus concentration of the Milwaukee River near the midpoint location in the action area. This location is upstream from a dam and may offer insight into phosphorus release from sediments trapped by the dam.

Site 3: Determines the total phosphorus concentration of the Milwaukee River at a location just downriver from the wastewater treatment plant outfall. This location was selected as it corresponds to a sample collection point used in earlier Milwaukee River testing.

Site 4: Determines the total phosphorus concentration of the Milwaukee River at the pour point of the action area. This corresponds to Sample Location 601 in the WPDES permit.

The Appendix includes a map of the locations of the four sample sites.

The following tables contain the phosphorus concentration test results from the data collected in 2025.

Table 4-1 | Total Phosphorus Concentration (mg/L) for 2025

Location	Site 1	Site 2	Site 3	Site 4
May	0.03	0.03	0.05	0.051
June	0.081	0.066	0.108	0.132
July	0.200	0.170	0.171	0.157
August	0.248	0.228	0.239	0.236
September	0.192	0.194	0.196	0.178
October	0.003	0.008	0.004	0.014
Median	**0.137**	**0.118**	**0.140**	**0.145**

Table 4-2 | Table 4-2 | Filtered Total Phosphorus Concentration (mg/L) for 2025

Location	Site 1	Site 2	Site 3	Site 4
May	0.019	0.033	0.033	0.026
June	0.058	0.058	0.094	0.087
July	0.170	0.167	0.157	0.152
August	0.166	0.192	0.175	0.181
September	0.183	0.186	0.163	0.167
October	0.001	0.0	0.007	0.017
Median	**0.112**	**0.113**	**0.126**	**0.120**

The data collected shows that the median total phosphorus concentration in 2025 was above the water quality criterion of 0.075 mg/L at all sample collection locations, with the value from Site 4 (the pour point) higher than the value from all the other sites.

The data collected shows that the highest total phosphorus concentration measured occurred in August. The flow in the river during August was one of the highest ever recorded as a result of extreme rainfall. The median total phosphorus concentration at Site 1, representing the Milwaukee River flowing into the action area, was almost the water quality standard. This continues the trends observed in the previous year's results:

- The total phosphorus concentration entering the action area is significant.
- It directly impacts the total phosphorus concentration outside the action area.

The data collected shows that the median filtered phosphorus concentration in 2025 remains a significant percentage of the total phosphorus. This result matches trends reported in previous years.

The total phosphorus confidence interval descriptive statistic was calculated for the 2025 data set at each sample location. The following table summarizes the median, confidence interval, and lower and upper confidence limits for the median based on the 80% value.

Table 4-3 | Median and Confidence Interval for Phosphorus Concentration (mg/L) Data for 2025

Location	Site 1	Site 2	Site 3	Site 4
Median	0.137	0.118	0.140	0.145
Confidence Interval (80%)	0.061	0.056	0.054	0.050
Lower Confidence Limit (LCL)	0.076	0.062	0.085	0.095
Upper Confidence Limit (UCL)	0.197	0.174	0.194	0.194

The confidence interval indicates an 80% chance that the median of the data will reside between 0.095 mg/L and 0.194 mg/L at Sample Collection Site 4. The confidence interval value decreases slightly from Site 1 to Site 4.

Expanding this analysis to include most of the data collected as part of the AM program, the following table compares the median, confidence interval, and upper confidence limit for the median of different combinations of the 5 years of data collected at the pour point.

Table 4-4 | Median, Confidence Interval, and Upper Confidence Limit for the Median at the Pour Point

Location	All Data Aug 2020 through Oct 2024	2022, 2023 & 2024 Data Only	2022 through 2025 Data only
Median	0.080	0.080	0.083
Count	29	18	24
Confidence Interval (80%)	0.013	0.018	0.017
Upper Confidence Limit (UCL)	0.093	0.098	0.10

The data collected in 2022 and 2023 showed a positive trend toward lowering the phosphorus concentration in the Milwaukee River to below the water quality standard. The data collected in 2024 and 2025 does not continue this trend. For any combination of the data chosen to analyze, the upper confidence limit for the median value of the data remains above the water quality standard.

Using the direct assessment of attainment approach to determine the plan for success, it is possible to conclude the following from the information contained in Table 4-4:

- The median total phosphorus concentration at the pour point is above the water quality criterion of 0.075 mg/L, considering four years' worth of data (2022 through 2025).
- The upper confidence limit for the median value is above the water quality criterion.

The result from this assessment is that the AM plan has not succeeded. Lowering the phosphorus concentration in the action area requires more work before the Grafton AM program can be considered successful.

5. Progress Update

The AM Plan target reductions were updated in the 2023 annual report. Table 5-1 lists the current target values.

Table 5-1 | Phosphorus Reduction Targets from AM Plan

Location	Reduction Target (lbs/yr)
Greater Milwaukee River Nonpoint Area Within MI-17 and MI-16	3,200
Treatment Plant	1,000
Total	**4,200**

The following is a summary of the reductions from the three areas that comprise Grafton's AM Plan.

Table 5-2 | Estimated Phosphorus Reduction Achieved to Date

Location	Reduction Target (lbs/yr)
Area 1 (removed from AM Plan)	0
Area 2	5,001
Area 3	>1,000
Total	**>6,000**

The phosphorus reduction attributed to Grafton exceeded the total target amount shown in Table 5-1 in 2025. The reductions summarized in Table 5-2 far exceed the minimum reduction requirement of 321.6 lbs/yr to qualify Grafton for continued implementation of AM for a second permit term to meet total phosphorus effluent requirements. The median phosphorus concentration in the Milwaukee River remains above the water quality criterion.

The wastewater treatment plant continues to average phosphorus reductions of approximately 1,000 lbs below pre-plan levels. Before the AM Plan began, the total effluent phosphorus concentration was around 0.6 mg/L. The current average plant flow is around 1.3 MGD. Using the effluent phosphorus concentration of 0.6 mg/L and the current average plant flow of 1.3 MGD, the phosphorus effluent mass discharge before implementing the AM plan was about 2,370 lbs per year. The following table shows the annual average effluent phosphorus mass discharges since plan implementation:

Table 5-3 | Annual Wastewater Treatment Plant Effluent Phosphorus Mass Discharges

Year	Phosphorus Mass Discharge (lbs/yr)
2022	1,319
2023	766
2024	1,386
3-year Average	**1,157**

Since the AM Plan began, the wastewater treatment plant staff has maintained an average reduction of more than 1,000 lbs of total phosphorus discharged to the Milwaukee River, confirming its inclusion in Table 5-2.

The annual data collected for 2025 indicates that the median total phosphorus concentration in the Milwaukee River has returned to pre-plan levels. A review of more data indicates that the median concentration remains about 0.08 mg/L above the water quality criterion.

6. Recommended Plan Changes

See the Renewal of Adaptive Management Plan for WPDES Permit Reissuance report for changes to the AM Plan.

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Appendix A
Agricultural Reference Information

Appendix A1
SnapPlus Summaries for Crop Year 2025

Century Acres
Annual BMP Summary

CENTURY ACRES	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
DEHLER 1	40.2	3	3	3	3	2.2	2.9	NO	NO	YES	SOYBEAN	WHEAT	NT	WHEAT
DEHLER 2	26.5	2	2	2	3	1.2	2	NO	YES	YES	CORN	WHEAT	NT	WHEAT
HOME 1	17.7	2	2	2	3	1.3	2	NO	YES	YES	NEW SEEDING	ALFALFA CLOVER	NT	HAY
HOME 2,3,6	35.3	2	3	2	3	0.3	1.7	YES	YES	YES	SOYBEAN	CORN	VT	NONE
KING	16.8	0	1	0	0	0	0	YES	NO	NO	CORN	NP	NT	NONE
KING WEST	3.4	0	1	0	0	0	0	YES	NO	NO	ALF/GRASS CLOVER	ALF/GRASS CLOVER	NT	HAY
LOWITZ 1	10.4	2	2	1	2	1.5	1.9	NO	YES	YES	CORN	SOYBEAN	NT	NONE
LOWITZ 2	13.3	0	0	0	0	0	0	NO	NO	NO	ALF/GRASS	ALFALFA GRASS	NT	HAY
LUCAS	75.2	1	3	2	3	1.3	1.9	YES	YES	YES	SOYBEAN	WHEAT	NT	WHEAT
LUCAS EAST	20.2	3	4	3	2	1.6	1.8	YES	NO	YES	WHEAT	CORN	FC	NONE
MILLIE	12.7	0	1	0	1	0.1	0.3	YES	YES	YES	SOYBEAN	CORN	NT	NONE
MUELLER 2	25	1	2	1	2	0.6	1.3	YES	YES	YES	ALF/GRASS	CORN	VT	HAY
SCHANEN MUELLER	165.3	4	7	4	4	2.8	2.9	YES	NO	YES	WHEAT	CORN	FC	NONE
SCHANEN S	51	4	6	3	4	1.5	2	YES	YES	YES	WHEAT	CORN	FC	NONE
SCHOBER	37.8	4	7	3	5	1.4	2.8	YES	YES	YES	WHEAT	CORN	FC	NONE
VETTER	49.7	2	4	2	4	1.2	2.9	YES	YES	YES	CORN	WHEAT	NT	WHEAT

CENTURY ACRES	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
VILLAGE GREEN	53.5	1	1	1	2	1.1	2	NO	YES	YES	CORN	SOYBEAN	NT	NONE
WOLLNER 1	12.5	2	2	1	2	0.7	1.8	NO	YES	YES	SOYBEAN	CORN	VT	NONE
WOLLNER 4	69	2	2	3	4	1.2	1.9	NO	YES	YES	CORN	SOYBEAN	NT	NONE
WOLLNER 5	56.7	2	2	3	5	0.9	2	NO	YES	YES	CORN	SOYBEAN	VT	NONE

792.2 ACRES

CENTURY ACRES	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
DEHLER 1	40.2	Y	Y	Y	N	1	$30	$1,206	0.0		
DEHLER 2	26.5	Y	Y	Y	N	1	$30	$795	0.0		
HOME 1	17.7	Y	Y	Y	N	1	$30	$531	0.0		
HOME 2,3,6	35.3	N	N	Y	N	1	$10	$353	35.3		
KING	16.8	N	N	N	N	1	$0	$0	16.8		
KING WEST	3.4	Y	Y	Y	N	1	$30	$102	3.4		
LOWITZ 1	10.4	N	N	Y	N	1	$10	$104	0.0		
LOWITZ 2	13.3	Y	Y	Y	N	1	$30	$399	0.0		
LUCAS	75.2	Y	Y	Y	N	1	$30	$2,256	150.4		
LUCAS EAST	20.2	Y	N	Y	Y	0	$0	$0	20.2		
MILLIE	12.7	N	N	Y	N	1	$10	$127	12.7		
MUELLER 2	25	Y	Y	N	N	1	$20	$500	25.0		
SCHANEN MUELLER	165.3	Y	N	Y	N	1	$20	$3,306	495.9		
SCHANEN S	51	Y	N	Y	N	1	$20	$1,020	102.0		
SCHOBER	37.8	Y	N	Y	N	1	$20	$756	113.4		
VETTER	49.7	Y	Y	Y	N	1	$30	$1,491	99.4		

CENTURY ACRES	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
VILLAGE GREEN	53.5	N	N	Y	N	1	$10	$535	0.0		
WOLLNER 1	12.5	N	N	Y	N	1	$10	$125	0.0		
WOLLNER 4	69	N	N	Y	N	1	$10	$690	0.0		
WOLLNER 5	56.7	N	N	Y	N	1	$10	$567	0.0		
	792.2						**TOTAL**	**$12,862**	**1075**	**LBS**	

Dave Polzin
Annual BMP Summary

DAVE POLZIN	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
CW	57.4	1	1	1	1	1.3	2	NO	NO	YES	SOYBEAN	SOYBEAN	SC	WHEAT

57.4 **ACRES**

DAVE POLZIN	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
CW	Y	Y	N	N	1	$20	$1,148	0.0		
						TOTAL	**$1,148**	**0**	**LBS**	

Highline Farms
Annual BMP Summary

HIGHLINE FARM	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
10-1 Schnitzer	15	1	2	1	2	0.4	1.2	YES	YES	YES	WHEAT	NEW SEEDING	NT	HAY
10-4 Justin	7.6	0	1	0	1	0.3	1.1	YES	YES	YES	WHEAT	NEW SEEDING	NT	HAY
10-5 Justin	44.7	1	1	1	1	1.3	1.8	NO	NO	YES	WHEAT	CORN	NT	MULTI SPECIES
10-6 Justin	18	1	2	2	1	2.6	1.9	YES	NO	NO	WHEAT	CORN	NT	MULTI SPECIES
10-7 Justin	3.7	1	5	1	2	0.9	2.9	YES	YES	YES	WHEAT	CORN	NT	MULTI SPECIES
10-8 Armstrong	4.4	0	3	0	1	0.4	1.5	YES	YES	YES	WHEAT	CORN	NT	MULTI SPECIES
11-1 Justin	25.1	0	0	0	1	0.3	1.3	NO	YES	YES	ALFALFA CLOVER	ALFALFA CLOVER	NT	HAY
11-3 Justin	2.6	0	0	0	1	0.2	1.2	NO	YES	YES	ALFALFA CLOVER	ALFALFA CLOVER	NT	HAY
11-4 Justin	9.9	1	1	1	2	0.6	2.4	NO	YES	YES	CORN	SOYBEAN	VT	NONE
11-5 Justin	9.7	0	1	0	2	0.6	3	YES	YES	YES	CORN	SOYBEAN	VT	NONE
11-6 Justin	24.3	0	1	1	2	0.5	2.9	YES	YES	YES	CORN	SOYBEAN	VT	NONE
11-7 Rick	24.5	1	2	1	2	0.5	2	YES	YES	YES	WHEAT	NEW SEEDING	NT	HAY
11-8 Justin	4.8	0	1	0	1	0.8	2.2	YES	YES	YES	CORN	SOYBEAN	VT	NONE
12-1 Miller	8.2	0	1	0	1	0.3	1	YES	YES	YES	SOYBEAN	WHEAT	NT	WHEAT

HIGHLINE FARM	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
12-2 Biever	10.8	2	1	2	2	2.5	3	NO	NO	YES	CORN	SOYBEAN	VT	NONE
12-3 Biever	5.5	0	0	0	0	0	0	NO	NO	NO	ALFALFA CLOVER GRASS	ALFALFA CLOVER GRASS	NT	HAY
12-4 Biever	16.2	3	1	2	2	2.9	2.4	NO	NO	NO	SOYBEAN	WHEAT	NT	WHEAT
12-6 Rick	34.5	1	3	1	2	0.9	1.9	YES	YES	YES	SOYBEAN	CORN	LD RIP	NONE
12-7 Horner	15.2	3	2	2	3	2.3	2.6	NO	YES	YES	SOYBEAN	CORN	LD RIP	NONE
13-1 Lundman	37	0	2	1	2	0.7	3	YES	YES	YES	CORN	SOYBEAN	NT	NONE
13-2 Rick	38	1	1	1	2	1.2	3	NO	YES	YES	CORN	SOYBEAN	VT	NONE
13-3 Church	5.7	1	2	1	2	1	2.5	YES	YES	YES	SOYBEAN	CORN	NT	NONE
13-4 Church	5	2	2	1	1	1.7	1.3	NO	NO	NO	SOYBEAN	CORN	NT	NONE
14-1 Heimerl	27.2	1	1	1	2	1.2	2.8	NO	YES	YES	CORN	SOYBEAN	VT	NONE
14-2 Heimerl	10.9	1	1	1	2	1.2	2.7	NO	YES	YES	CORN	SOYBEAN	VT	NONE
14-3 Heimerl	8.7	1	1	2	3	2.2	3	NO	YES	YES	CORN	SOYBEAN	VT	NONE
14-7 Mertzdorf	34.7	0	3	0	1	0.3	1.6	YES	YES	YES	WHEAT	SOYBEAN	NT	MULTI SPECIES
14-8 Mertzdorf	2.7	0	3	0	1	0.3	1.6	YES	YES	YES	WHEAT	SOYBEAN	NT	MULTI SPECIES

HIGHLINE FARM	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
15-1 Olsen	25.5	1	1	1	1	1.1	1.8	NO	NO	YES	SOYBEAN	CORN	NT	NONE
15-2 Olsen	6.8	1	4	1	2	1	2.7	YES	YES	YES	SOYBEAN	CORN	NT	NONE
2-18 Schommer	45.3	1	4	1	3	0.4	3	YES	YES	YES	ALFALFA	CORN	NT	NONE

532.2 ACRES

HIGHLINE FARM	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
10-1 Schnitzer	15	Y	Y	Y	N	1	$30	$450	15.0		
10-4 Justin	7.6	Y	Y	Y	N	1	$30	$228	7.6		
10-5 Justin	44.7	Y	N	Y	N	1	$20	$894	0.0		
10-6 Justin	18	Y	N	Y	N	1	$20	$360	18.0		
10-7 Justin	3.7	Y	N	Y	N	1	$20	$74	14.8		
10-8 Armstrong	4.4	Y	N	Y	N	1	$20	$88	13.2		
11-1 Justin	25.1	Y	Y	Y	N	1	$30	$753	0.0		
11-3 Justin	2.6	Y	Y	Y	N	1	$30	$78	0.0		
11-4 Justin	9.9	N	N	Y	N	1	$10	$99	0.0		
11-5 Justin	9.7	N	N	Y	N	1	$10	$97	9.7		
11-6 Justin	24.3	N	N	Y	N	1	$10	$243	24.3		
11-7 Rick	24.5	Y	Y	Y	N	1	$30	$735	24.5		
11-8 Justin	4.8	N	N	Y	N	1	$10	$48	4.8		
12-1 Miller	8.2	Y	Y	Y	N	1	$30	$246	8.2		

HIGHLINE FARM	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
12-2 Biever	10.8	N	N	Y	N	1	$10	$108	0.0		
12-3 Biever	5.5	Y	Y	Y	N	1	$30	$165	0.0		
12-4 Biever	16.2	Y	Y	Y	N	1	$30	$486	0.0		
12-6 Rick	34.5	N	N	Y	N	1	$10	$345	69.0		
12-7 Horner	15.2	N	N	Y	N	1	$10	$152	0.0		
13-1 Lundman	37	N	N	Y	N	1	$10	$370	74.0		
13-2 Rick	38	N	N	Y	N	1	$10	$380	0.0		
13-3 Church	5.7	N	N	Y	N	1	$10	$57	5.7		
13-4 Church	5	N	N	Y	N	1	$10	$50	0.0		
14-1 Heimerl	27.2	N	N	Y	N	1	$10	$272	0.0		
14-2 Heimerl	10.9	N	N	Y	N	1	$10	$109	0.0		
14-3 Heimerl	8.7	N	N	Y	N	1	$10	$87	0.0		
14-7 Mertzdorf	34.7	Y	N	Y	N	1	$20	$694	104.1		
14-8 Mertzdorf	2.7	Y	N	Y	N	1	$20	$54	8.1		

HIGHLINE FARM	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
15-1 Olsen	25.5	N	N	Y	N	1	$10	$255	0.0		
15-2 Olsen	6.8	N	N	Y	N	1	$10	$68	20.4		
2-18 Schommer	45.3	N	N	N	Y	0	$0	$0	135.9		
	532.2						**TOTAL**	**$8,045**	**557**	**LBS**	

Kent Schueller
Annual BMP Summary

KENT SCHUELLER	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
SCHUELLER 1	8.9	2	1	1	1	1.6	2	NO	NO	YES	SOYBEAN	WHEAT	NT	WHEAT
SCHUELLER 2	14.8	1	2	1	1	0.7	1.7	YES	NO	YES	SOYBEAN	WHEAT	NT	WHEAT

23.7 ACRES

KENT SCHUELLER	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
SCHUELLER 1	8.9	Y	Y	Y	Y	0	$0	$0	0.0		
SCHUELLER 2	14.8	Y	Y	Y	Y	0	$30	$444	14.8		
	23.7						**TOTAL**	$444	**15**	**LBS**	

The field designated as Schueller 2 did produce a P reduction using Snap Plus modelling, in spite of a manure application. Even though the manure application would disqualify the field, it is recommended in this case to pay an incentive because of the P reduction. This field did meet the three milestones of green living & total cover. The incenetive to be paid = $30 x 14.8 acres = $444.

Paulus
Annual BMP Summary

PAULUS DAIRY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
A3	20	1	3	2	4	0.9	3	YES	YES	YES	CORN	NEW SEEDING	SC	RYE
A4	12.9	2	4	1	5	0.7	3	YES	YES	YES	CORN	NEW SEEDING	SC	RYE
A5	24.2	0	0	1	2	0.5	2.5	NO	YES	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
A6	23	1	5	1	2	0.9	2.6	YES	YES	YES	CORN	CORN	NT	WHEAT
A7	28.5	1	5	1	2	0.9	2.6	YES	YES	YES	CORN	CORN	NT	WHEAT
A8	22.9	1	1	2	4	0.9	3	NO	YES	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
DM 1-2	27.1	0	0	1	3	0.9	2.5	NO	YES	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
DM5	4.2	0	0	0	2	0.5	2.5	NO	YES	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
DM6	11.7	2	3	2	3	2	2.7	YES	YES	YES	OATS	WHEAT	NT	MULTI SPECIES
DM7	5.9	1	1	2	2	2.5	2.7	NO	NO	YES	SOYBEAN	SOYBEAN	FC	NONE
HOME 11	14	1	2	1	2	0.2	1.2	YES	YES	YES	ALF CLOVER GRASS	CORN	NT	HAY
HOME 12-13-14-15	33.1	1	3	1	4	0.7	3	YES	YES	YES	ALF CLOVER GRASS	CORN	NT	HAY

PAULUS DAIRY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
HOME 16-17	19.1	1	2	1	2	0.2	1.5	YES	YES	YES	ALF CLOVER GRASS	CORN	NT	HAY
HOME 23	1.8	3	9	3	5	1	3	YES	YES	YES	WHEAT	CORN	NT	WHEAT
HOME 24	11.5	2	9	2	5	0.8	3	YES	YES	YES	WHEAT	CORN	NT	WHEAT
HOME 25	18.4	2	5	2	4	0.7	2	YES	YES	YES	WHEAT	CORN	NT	WHEAT
HOME 26	5.4	2	7	1	3	0.6	2.4	YES	YES	YES	WHEAT	CORN	NT	WHEAT
HOME 27	4.8	3	8	2	4	1.5	3	YES	YES	YES	WHEAT	CORN	NT	WHEAT
HOME 31	27.2	1	4	1	4	1.4	2	YES	YES	YES	CORN	CORN	NT	WHEAT
HOME 32	8.8	1	4	1	2	1.4	2	YES	YES	YES	CORN	CORN	NT	WHEAT
HOME 6-NIC 20	32.2	2		1		0.4		NO	NO	NO	ALF CLOVER GRASS	CORN	NT	HAY
HOME 7	5.1							NO	NO	NO	ALF CLOVER GRASS	CORN	NT	HAY
HOME 8	3.5	3		2		0.2		NO	NO	NO	CORN	CORN	NT	WHEAT
HOME 9-10	26.1	1	2	1	3	0.2	1.5	YES	YES	YES	ALF CLOVER GRASS	CORN	NT	HAY
HOME NIC 18-19	39.8	2	4	1	4	0.4	2.4	YES	YES	YES	CORN SILAGE	NEW SEEDING	SC	RYE
HOME NIC 21	12.7	2	4	2	5	0.7	2.8	YES	YES	YES	CORN SILAGE	NEW SEEDING	SC	RYE
HOME NIC 22	9.1	2	4	1	4	0.4	2.4	YES	YES	YES	CORN SILAGE	NEW SEEDING	SC	RYE
JANIK-1	5.4	1	3	1	1	1.4	1.7	YES	NO	YES	CORN	CORN	NT	WHEAT
JANIK-2	16.9	2	2	1	1	1.1	1.5	NO	NO	YES	CORN	CORN	NT	WHEAT
JANIK-3	5.8	1	6	1	2	0.6	2.9	YES	YES	YES	CORN	CORN	NT	WHEAT

PAULUS DAIRY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
JANIK-4	8	1	6	1	2	0.6	2.9	YES	YES	YES	CORN	CORN	NT	WHEAT
JANIK-5	14.7	2	6	1	3	0.8	2.4	YES	YES	YES	CORN	CORN	NT	WHEAT
JANIK-6	11.7	2	5	1	2	1.2	1.7	YES	YES	YES	CORN	CORN	NT	WHEAT
JANIK-7	13	1	5	1	1	0.7	1.8	YES	NO	YES	CORN	CORN	NT	WHEAT
JANIK-8	50.6	2	4	1	3	0.8	2.4	YES	YES	YES	CORN	CORN	NT	WHEAT
LM3-4	33.1	0	1	1	2	1.2	2.9	YES	YES	YES	NEW SEEDING	ALF CLOVER GRASS	NT	HAY
LUBNER 1	9.7	0	0	1	2	0.7	2	NO	YES	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
LUBNER 2	25.6	1	1	1	2	0.7	2	NO	YES	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
LUBNER 3	9.4	1	3	1	2	0.6	2	YES	YES	YES	NONE	CORN	NT	MULTI SPECIES
LUBNER 4	37.5	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
LUBNER 5	32.8	1	3	1	3	0.6	2.6	YES	YES	YES	ALF CLOVER GRASS	CORN	NT	HAY
LUBNER 6	3	1	1	2	2	0.9	1.4	NO	NO	YES	ALF CLOVER GRASS	CORN	NT	HAY
RB8	12.1	1	2	1	2	0.8	1.8	YES	YES	YES	NONE	NEW SEEDING	NT	MULTI SPECIES
RB9	3.9	2	3	1	3	0.8	2	YES	YES	YES	NONE	CORN	NT	MULTI SPECIES

PAULUS DAIRY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
V-1	19.4	0	1	1	1	0.7	1.2	YES	NO	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-10	11.6	0		1		0.1		NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-11	8.3	0		0		0.2		NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-12	9.8	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-13	1.7	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-14	6	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-15	6.3	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-16	4.6	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-17	4.9	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY

PAULUS DAIRY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
V-18	2.2	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-2	2	0	0	1	2	0.1	1	NO	YES	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-4	20.5	0	0	0	1	0.2	1.5	NO	YES	YES	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-7	5.6	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-8	4.7	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY
V-9	8.2	0	0	0	0	0	0	NO	NO	NO	ALF CLOVER GRASS	ALF CLOVER GRASS	NT	HAY

862 ACRES

PAULUS DAIRY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
A3	20	N	N	N	N	1	$0	$0	40.0		
A4	12.9	N	N	N	N	1	$0	$0	25.8		
A5	24.2	Y	Y	Y	N	1	$30	$726	0.0		
A6	23	N	Y	Y	N	1	$20	$460	92.0		
A7	28.5	N	Y	Y	N	1	$20	$570	114.0		
A8	22.9	Y	Y	Y	N	1	$30	$687	0.0		
DM 1-2	27.1	Y	Y	Y	N	1	$30	$813	0.0		
DM5	4.2	Y	Y	Y	N	1	$30	$126	0.0		
DM6	11.7	Y	Y	Y	N	1	$30	$351	11.7		
DM7	5.9	N	N	Y	N	1	$10	$59	0.0		
HOME 11	14	Y	Y	N	N	1	$20	$280	14.0		
HOME 12-13-14-15	33.1	Y	Y	N	N	1	$20	$662	66.2		

PAULUS DAIRY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
HOME 16-17	19.1	Y	Y	N	N	1	$20	$382	19.1		
HOME 23	1.8	Y	Y	N	N	1	$20	$36	10.8		
HOME 24	11.5	Y	Y	N	N	1	$20	$230	80.5		
HOME 25	18.4	Y	Y	N	N	1	$20	$368	55.2		
HOME 26	5.4	Y	Y	N	N	1	$20	$108	27.0		
HOME 27	4.8	Y	Y	N	Y	0	$0	$0	24.0		
HOME 31	27.2	Y	Y	Y	N	1	$30	$816	81.6		
HOME 32	8.8	Y	Y	Y	Y	0	$0	$0	26.4		
HOME 6-NIC 20	32.2	Y	Y	N	Y	0	$0	$0	0.0		
HOME 7	5.1	Y	Y	N	Y	0	$0	$0	0.0		
HOME 8	3.5	Y	N	N	Y	0	$0	$0	0.0		
HOME 9-10	26.1	Y	Y	N	N	1	$20	$522	26.1		
HOME NIC 18-19	39.8	N	N	N	N	1	$0	$0	79.6		
HOME NIC 21	12.7	N	N	N	Y	0	$0	$0	25.4		
HOME NIC 22	9.1	N	N	N	N	1	$0	$0	18.2		
JANIK-1	5.4	N	N	Y	N	1	$10	$54	10.8		
JANIK-2	16.9	N	N	Y	N	1	$10	$169	0.0		
JANIK-3	5.8	N	N	Y	N	1	$10	$58	29.0		

PAULUS DAIRY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
JANIK-4	8	N	Y	Y	Y	0	$0	$0	40.0		
JANIK-5	14.7	N	Y	Y	Y	0	$0	$0	58.8		
JANIK-6	11.7	N	N	Y	N	1	$10	$117	35.1		
JANIK-7	13	N	N	Y	Y	0	$0	$0	52.0		
JANIK-8	50.6	N	Y	Y	Y	0	$0	$0	101.2		
LM3-4	33.1	Y	Y	Y	N	1	$30	$993	33.1		
LUBNER 1	9.7	Y	Y	Y	N	1	$30	$291	0.0		
LUBNER 2	25.6	Y	Y	Y	N	1	$30	$768	0.0		
LUBNER 3	9.4	Y	Y	N	N	1	$20	$188	18.8		
LUBNER 4	37.5	Y	Y	Y	N	1	$30	$1,125	0.0		
LUBNER 5	32.8	Y	Y	Y	Y	0	$0	$0	65.6		
LUBNER 6	3	Y	Y	Y	Y	0	$0	$0	0.0		
RB8	12.1	Y	Y	N	Y	0	$0	$0	12.1		
RB9	3.9	Y	Y	N	N	1	$20	$78	3.9		

PAULUS DAIRY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
V-1	19.4	Y	Y	Y	N	1	$30	$582	19.4		
V-10	11.6	Y	Y	Y	N	1	$30	$348	0.0		
V-11	8.3	Y	Y	Y	N	1	$30	$249	0.0		
V-12	9.8	Y	Y	Y	N	1	$30	$294	0.0		
V-13	1.7	Y	Y	Y	N	1	$30	$51	0.0		
V-14	6	Y	Y	Y	N	1	$30	$180	0.0		
V-15	6.3	Y	Y	Y	N	1	$30	$189	0.0		
V-16	4.6	Y	Y	Y	N	1	$30	$138	0.0		
V-17	4.9	Y	Y	Y	N	1	$30	$147	0.0		

PAULUS DAIRY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
V-18	2.2	Y	Y	Y	N	1	$30	$66	0.0		
V-2	2	Y	Y	Y	N	1	$30	$60	0.0		
V-4	20.5	Y	Y	Y	N	1	$30	$615	0.0		
V-7	5.6	Y	Y	Y	N	1	$30	$168	0.0		
V-8	4.7	Y	Y	Y	N	1	$30	$141	0.0		
V-9	8.2	Y	Y	Y	N	1	$30	$246	0.0		
	862						**TOTAL**	**$14,511**	**1317**	**LBS**	

Roden Echo Valley
Annual BMP Summary

RODEN ECHO VALLEY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
ANSAY 1	13.8	0	0	1	1	0.8	1.6	NO	NO	YES	CORN	SOYBEAN	NT	NONE
ANSAY 2	8.4	0	1	1	1	1.5	2.3	YES	NO	YES	CORN	SOYBEAN	NT	NONE
ANSAY 3	11.7	1	1	1	1	1.5	2.3	NO	NO	YES	CORN	SOYBEAN	NT	NONE
ANSAY 4	3.1	0	1	0	1	0.4	1.7	YES	YES	YES	CORN	SOYBEAN	NT	NONE
BELL 1B	21.1	1	2	1	1	1.1	2.3	YES	NO	YES	SOYBEAN	CORN	NT	NONE
BORES 1	67.3	4	8	2	3	1.1	2.7	YES	YES	YES	WHEAT	CORN	NT	MULTI SPECIES
BORES 5	0.6	0	0	0	0	0.1	1	NO	NO	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
BUNK 1	23.7	1	2	1	2	1	2.8	YES	YES	YES	CORN	SOYBEAN	NT	NONE
BUNK 2	33.5	1	2	1	2	1	2.9	YES	YES	YES	CORN	SOYBEAN	NT	NONE
DENSOW 1	6.3	1	3	1	2	1.6	3	YES	YES	YES	SOYBEAN	CORN	NT	RYE
DENSOW 2	3.8	1	2	1	1	0.8	2.1	YES	NO	YES	SOYBEAN	CORN	NT	RYE
DENSOW 3	6.3	1	2	1	1	1	2.1	YES	NO	YES	SOYBEAN	CORN	NT	RYE
DENSOW 4	16.4	4	4	3	2	3.3	3	NO	NO	NO	SOYBEAN	CORN	NT	RYE

RODEN ECHO VALLEY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
DENSOW 5	16.8	3	4	2	2	2.2	2.8	YES	NO	YES	SOYBEAN	CORN	NT	RYE
DENSOW 6	6.2	2	3	1	2	1	2.1	YES	YES	YES	SOYBEAN	CORN	NT	RYE
DRIES 1	9.5	1	1	1	1	1.1	2	NO	NO	YES	CORN	WHEAT	NT	WHEAT
DRIES 2	7	2	2	2	3	1.6	2.8	NO	YES	YES	CORN	WHEAT	NT	WHEAT
DRIES 3	4.6	2	2	2	2	1.2	2	NO	NO	YES	CORN	WHEAT	NT	WHEAT
DRIES 4	5.7	1	1	1	2	0.6	2.9	NO	YES	YES	CORN	WHEAT	NT	WHEAT
DRIES 5,6	37.5	0	1	0	2	0.2	1.5	YES	YES	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
DRIES 7,8	11.4	0	0	0	1	0.4	2	NO	YES	YES	ALFALFA/ GRASS CLOVER	CORN	NT	HAY
FAY 1F	54	1	2	0	1	0.3	0.8	YES	YES	YES	ALFALFA/ GRASS CLOVER	CORN	NT	NONE
GOSEWHERIG	33.5	2	5	2	2	1.6	2.8	YES	NO	YES	WHEAT	CORN	NT	NONE
GOSEWHER 2G	9.8	0	0	1	1	0.1	0.4	NO	NO	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
GOSEWHER 3G	7.2	3	1	1	1	1.9	1.3	NO	NO	NO	CORN	CORN	NT	NONE
GUNDRUM 1	36.6	0	2	1	1	0.6	1.4	YES	NO	YES	SOYBEAN	CORN	NT	WHEAT

RODEN ECHO VALLEY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
GUNDRUM 2	9.5	0	2	0	1	0.7	1.7	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
HEIFER 1	19.6	1	1	1	1	1.4	2.5	NO	NO	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
HEIFER 2	20.7	1	3	1	2	0.8	1.9	YES	YES	YES	CORN	CORN	NT	RYE
JOBS 1	13.3	0	0	1	3	0.5	3	NO	YES	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
JOBS 2	11.7	0	0	1	3	0.2	2.8	NO	YES	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
JOBS 3	0.6	0	1	1	1	0.1	0.4	YES	NO	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
JOBS 4	1.1	0	0	1	3	0.3	2.9	NO	YES	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
JOBS 5	1	0	0	1	3	0.3	2.9	NO	YES	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
JOE HOME 2H	2.1	3	3	1	2	1.5	2	NO	YES	YES	CORN	CORN	NT	NONE
JOE HOME 3H	19.1	1	3	1	2	1.6	2.2	YES	YES	YES	CORN	CORN	NT	NONE
JOE HOME 4H	3.5	4	7	2	5	0.9	3	YES	YES	YES	CORN	CORN	NT	NONE

RODEN ECHO VALLEY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
KOHLWEY 1K	10.4	2	5	1	2	1	2.5	YES	YES	YES	CORN	CORN	SC	NONE
KOHLWEY 2K	21.7	2	2	2	2	1.3	2	NO	NO	YES	CORN	CORN	SC	NONE
LANE NORTH 1L, 2L	14.4	1	2	1	1	1.3	2	YES	NO	YES	CORN	SOYBEAN	NT	WHEAT
LANE NORTH 3L	18	2	1	2	2	1.6	1.6	NO	NO	NO	CORN	SOYBEAN	NT	WHEAT
LANE NORTH 4L	7.5	1	3	1	1	1.4	1.9	YES	NO	YES	WHEAT	SOYBEAN	NT	WHEAT
LANE NORTH 5L	1.4	1	2	1	1	0.8	1.9	YES	NO	YES	WHEAT	SOYBEAN	NT	WHEAT
LAST 1	4.2	1	2	1	1	0.5	1.9	YES	NO	YES	SOYBEAN	CORN	NT	WHEAT
LAST 2	8.1	1	2	1	1	0.5	1.9	YES	NO	YES	SOYBEAN	CORN	NT	WHEAT
LAST 3	5.4	1	2	1	1	0.5	1.9	YES	NO	YES	SOYBEAN	CORN	NT	WHEAT
LAST 4	14.8	1	1	1	1	0.5	1.9	NO	NO	YES	SOYBEAN	CORN	NT	WHEAT
LAST 6	6.7	1	5	1	2	0.5	1.8	YES	YES	YES	CORN	CORN	NT	RYE
LUEDKE IL	13.1	0	0	0	1	0.3	0.9	NO	YES	YES	CORN	SOYBEAN	NT	NONE
MANTERNA CH 1	10.1	0	1	0	1	0.3	1.9	YES	YES	YES	CORN	CORN	NT	NONE

RODEN ECHO VALLEY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
MARRA 1M	13.4	1	2	2	2	1.9	3	YES	NO	YES	CORN	SOYBEAN	NT	WHEAT
RATHKE 1	3.8	1	2	1	2	0.9	1.6	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
RATHKE 2	7.2	0	1	1	1	0.9	1.7	YES	NO	YES	SOYBEAN	CORN	NT	WHEAT
RATHKE 3	7.4	0	2	0	2	0.4	2	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
RATHKE 4	3.8	0	2	0	1	0.4	2	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
RATHKE 5	6.7	0	1	0	1	0.4	2	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
REITER 1R	9.6	1	1	0	1	0.3	0.9	NO	YES	YES	CORN	NEW SEEDING	NT	RYE
REITER 2R	14.5	1	3	0	1	0.6	1.7	YES	YES	YES	CORN	NEW SEEDING	NT	RYE
REITER 3R	4.8	1	4	1	2	0.7	2.9	YES	YES	YES	CORN	CORN	NT	RYE
RODEN 2	33	1	1	0	1	0.5	1.7	NO	YES	YES	CORN	SOYBEAN	NT	WHEAT
SLT 2S	7.3	1	2	1	1	0.8	2	YES	NO	YES	CORN	SOYBEAN	NT	NONE
SPINTI 1S	3.8	0	0	0	1	0.6	1.2	NO	YES	YES	CORN	WHEAT	NT	WHEAT
SPINTI 2S	14.9	1	1	1	1	0.9	2	NO	NO	YES	CORN	WHEAT	NT	WHEAT
SPINTI 4S	5.6	5	3	2	1	2.3	1.4	NO	NO	NO	WHEAT	CORN	VT	MULTI SPECIES
STREHLOW 1S	3.2	1	1	0	1	0.4	1.9	NO	YES	YES	CORN	SOYBEAN	NT	WHEAT

RODEN ECHO VALLEY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
STREHLOW 2S	7.7	1	2	1	2	0.7	3	YES	YES	YES	CORN	SOYBEAN	NT	WHEAT
STROEBEL 2	0.6	3	1	1	1	2.5	2.3	NO	NO	NO	SOYBEAN	CORN	NT	WHEAT
STROEBEL 3	5.8	2	4	1	2	2.2	2.9	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
STROEBEL 4	10	1	3	0	1	0.5	2.9	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
STROEBEL 5	18.9	0	2	0	1	0.5	1.6	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
STROEBEL 6	3.8	1	2	0	1	1	2.9	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
STROEBEL 7	5.6	0	1	0	1	0.5	1.6	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
STROEBEL 8	7.9	0	1	0	1	0.2	1.4	YES	YES	YES	SOYBEAN	CORN	NT	WHEAT
TESKER 1	23	2	2	2	2	1.8	2.7	NO	NO	YES	CORN	WHEAT	NT	WHEAT
TESKER 2	5.3	2	2	2	2	1.5	2.1	NO	NO	YES	CORN	WHEAT	NT	WHEAT
TESKER 3	20.7	1	2	1	3	1.5	2.9	YES	YES	YES	CORN	NEW SEEDING	VT	RYE
TESKER 4	9.4	1	1	1	2	0.8	2.8	NO	YES	YES	CORN	NEW SEEDING	VT	RYE
TESKER 5	9.4	0	0	1	2	1.3	1.9	NO	YES	YES	ALFALFA/ GRASS CLOVER	ALFALFA/ GRASS CLOVER	NT	HAY
WORTH O-1	49.7	0	1	0	1	0.2	1.4	YES	YES	YES	CORN	CORN	NT	NONE

RODEN ECHO VALLEY	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
WORTH O-2	27	0	1	0	1	0.2	1.4	YES	YES	YES	CORN	CORN	NT	NONE
WORTH O-3	1.5	0	1	0	1	0.2	1.4	YES	YES	YES	CORN	CORN	NT	NONE
WORTH O-4	8.9	0	1	0	1	0.2	1.4	YES	YES	YES	CORN	CORN	NT	NONE
WORTH O-5	2.2	0	1	0	1	0.4	1.9	YES	YES	YES	CORN	CORN	NT	NONE
WORTH O-6	2.5	0	1	0	1	0.4	1.9	YES	YES	YES	CORN	CORN	NT	NONE
WORTH O-7	2.9	0	1	0	1	0.2	1.4	YES	YES	YES	CORN	CORN	NT	NONE
	1055.6 ACRES													

RODEN ECHO VALLEY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
ANSAY 1	13.8	N	N	Y	N	1	$10	$138	0.0		
ANSAY 2	8.4	N	N	Y	N	1	$10	$84	8.4		
ANSAY 3	11.7	N	N	Y	N	1	$10	$117	0.0		
ANSAY 4	3.1	N	N	Y	N	1	$10	$31	3.1		
BELL 1B	21.1	N	N	Y	N	1	$10	$211	21.1		
BORES 1	67.3	Y	Y	Y	Y	0	$0	$0	269.2		
BORES 5	0.6	Y	Y	Y	N	1	$30	$18	0.0		
BUNK 1	23.7	N	N	Y	N	1	$10	$237	23.7		
BUNK 2	33.5	N	N	Y	N	1	$10	$335	33.5		
DENSOW 1	6.3	N	N	Y	N	1	$10	$63	12.6		
DENSOW 2	3.8	N	N	Y	N	1	$10	$38	3.8		
DENSOW 3	6.3	N	N	Y	N	1	$10	$63	6.3		
DENSOW 4	16.4	N	N	Y	N	1	$10	$164	0.0		

RODEN ECHO VALLEY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
DENSOW 5	16.8	N	N	Y	N	1	$10	$168	16.8		
DENSOW 6	6.2	N	N	Y	N	1	$10	$62	6.2		
DRIES 1	9.5	Y	Y	Y	N	1	$30	$285	0.0		
DRIES 2	7	Y	Y	Y	N	1	$30	$210	0.0		
DRIES 3	4.6	Y	Y	Y	N	1	$30	$138	0.0		
DRIES 4	5.7	Y	Y	Y	N	1	$30	$171	0.0		
DRIES 5,6	37.5	Y	Y	Y	N	1	$30	$1,125	37.5		
DRIES 7,8	11.4	Y	Y	N	N	1	$20	$228	0.0		
FAY 1F	54	Y	N	Y	Y	0	$0	$0	54.0		
GOSEWHERIG	33.5	Y	N	Y	Y	0	$0	$0	100.5		
GOSEWHER 2G	9.8	Y	Y	Y	N	1	$30	$294	0.0		
GOSEWHER 3G	7.2	N	N	Y	Y	0	$0	$0	0.0		
GUNDRUM 1	36.6	N	Y	Y	N	1	$20	$732	73.2		

RODEN ECHO VALLEY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
GUNDRUM 2	9.5	N	Y	Y	N	1	$20	$190	19.0		
HEIFER 1	19.6	Y	Y	Y	N	1	$30	$588	0.0		
HEIFER 2	20.7	N	Y	Y	N	1	$20	$414	41.4		
JOBS 1	13.3	Y	Y	Y	N	1	$30	$399	0.0		
JOBS 2	11.7	Y	Y	Y	N	1	$30	$351	0.0		
JOBS 3	0.6	Y	Y	Y	N	1	$30	$18	0.6		
JOBS 4	1.1	Y	Y	Y	N	1	$30	$33	0.0		
JOBS 5	1	Y	Y	Y	N	1	$30	$30	0.0		
JOE HOME 2H	2.1	N	N	Y	N	1	$10	$21	0.0		
JOE HOME 3H	19.1	N	N	Y	N	1	$10	$191	38.2		
JOE HOME 4H	3.5	N	N	Y	N	1	$10	$35	10.5		

RODEN ECHO VALLEY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
KOHLWEY 1K	10.4	N	N	N	N	1	$0	$0	31.2		
KOHLWEY 2K	21.7	N	N	N	N	1	$0	$0	0.0		
LANE NORTH 1L, 2L	14.4	N	N	Y	N	1	$10	$144	14.4		
LANE NORTH 3L	18	N	N	Y	N	1	$10	$180	0.0		
LANE NORTH 4L	7.5	Y	N	Y	Y	0	$0	$0	15.0		
LANE NORTH 5L	1.4	Y	N	Y	Y	0	$0	$0	1.4		
LAST 1	4.2	N	N	Y	Y	0	$0	$0	4.2		
LAST 2	8.1	N	N	Y	Y	0	$0	$0	8.1		
LAST 3	5.4	N	N	Y	Y	0	$0	$0	5.4		
LAST 4	14.8	N	N	Y	Y	0	$0	$0	0.0		
LAST 6	6.7	N	N	Y	N	1	$10	$67	26.8		
LUEDKE IL	13.1	N	N	Y	N	1	$10	$131	0.0		
MANTERNA CH 1	10.1	N	N	Y	N	1	$10	$101	10.1		

RODEN ECHO VALLEY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
MARRA 1M	13.4	N	N	Y	Y	0	$0	$0	13.4		
RATHKE 1	3.8	N	Y	N	N	1	$10	$38	3.8		
RATHKE 2	7.2	N	Y	N	N	1	$10	$72	7.2		
RATHKE 3	7.4	N	Y	N	N	1	$10	$74	14.8		
RATHKE 4	3.8	N	Y	N	N	1	$10	$38	7.6		
RATHKE 5	6.7	N	Y	N	N	1	$10	$67	6.7		
REITER 1R	9.6	Y	Y	Y	N	1	$30	$288	0.0		
REITER 2R	14.5	Y	Y	Y	N	1	$30	$435	29.0		
REITER 3R	4.8	Y	Y	Y	N	1	$30	$144	14.4		
RODEN 2	33	N	N	Y	N	1	$10	$330	0.0		
SLT 2S	7.3	N	N	Y	N	1	$10	$73	7.3		
SPINTI 1S	3.8	Y	Y	Y	N	1	$30	$114	0.0		
SPINTI 2S	14.9	Y	Y	Y	N	1	$30	$447	0.0		
SPINTI 4S	5.6	Y	Y	Y	Y	0	$0	$0	0.0		
STREHLOW 1S	3.2	N	N	Y	N	1	$10	$32	0.0		

RODEN ECHO VALLEY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
STREHLOW 2S	7.7	N	N	Y	N	1	$10	$77	7.7		
STROEBEL 2	0.6	N	N	Y	N	1	$10	$6	0.0		
STROEBEL 3	5.8	N	N	Y	N	1	$10	$58	11.6		
STROEBEL 4	10	N	N	Y	N	1	$10	$100	20.0		
STROEBEL 5	18.9	N	N	Y	N	1	$10	$189	37.8		
STROEBEL 6	3.8	N	N	Y	N	1	$10	$38	3.8		
STROEBEL 7	5.6	N	N	Y	N	1	$10	$56	5.6		
STROEBEL 8	7.9	N	N	Y	N	1	$10	$79	7.9		
TESKER 1	23	Y	Y	Y	N	1	$30	$690	0.0		
TESKER 2	5.3	Y	Y	Y	N	1	$30	$159	0.0		
TESKER 3	20.7	N	N	Y	N	1	$10	$207	20.7		
TESKER 4	9.4	N	N	Y	N	1	$10	$94	0.0		
TESKER 5	9.4	Y	Y	Y	N	1	$30	$282	0.0		
WORTH O-1	49.7	N	N	Y	Y	0	$0	$0	49.7		

RODEN ECHO VALLEY	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
WORTH O-2	27	N	N	Y	Y	0	$0	$0	27.0		
WORTH O-3	1.5	N	N	Y	Y	0	$0	$0	1.5		
WORTH O-4	8.9	N	N	Y	Y	0	$0	$0	8.9		
WORTH O-5	2.2	N	N	Y	Y	0	$0	$0	2.2		
WORTH O-6	2.5	N	N	Y	Y	0	$0	$0	2.5		
WORTH O-7	2.9	N	N	Y	Y	0	$0	$0	2.9		
	1055.6						**TOTAL**	**$11,992**	**1210**	**LBS**	

Triangle
Annual BMP Summary

TRIANGLE ACRES	ACRES	2025 ACTUAL PI	2025 BASELINE PI	ACTUAL ROTATIONAL PI 2021-2028	BASELINE ROTATIONAL PI 2021-2028	ACTUAL ROTATIONAL EROSION	BASELINE ROTATIONAL EROSION	P MODEL SHOWS 2025 DELIVERY REDUCTION	P MODEL SHOWS ROTATIONAL DELIVERY REDUCTION	CURRENT YEAR EROSION REDUCTION?	2024 CROP	2025 CROP	TILLAGE SYSTEM	COVER CROP(S)
Ansay 1	18.2	4	6	3	3	2.9	2.9	YES	NO	NO	CORN	CORN	NT	WHEAT
Ansay 2	8	2	4	1	4	0.7	3	YES	YES	YES	ALF/GRASS CLOVER	CORN	NT	HAY
Ansay 3	28.3	1	2	1	3	1	3	YES	YES	YES	ALF/GRASS CLOVER	CORN	NT	HAY
Dimmer	52	3	5	2	3	1.8	2.8	YES	YES	YES	CORN	CORN	NT	NONE
Ed Thill 1	26.5	1	1	2	4	1	3	NO	YES	YES	ALF/GRASS CLOVER	ALF/GRASS CLOVER	NT	HAY
Ed Thill 2	18.3	3	6	2	3	1.1	2.4	YES	YES	YES	CORN	CORN	NT	NONE
Ed Thill 3-4	23.3	3	6	2	3	1.1	2.4	YES	YES	YES	CORN	CORN	NT	NONE
Ed Thill 5	6.2	1	4	1	2	0.3	1.1	YES	YES	YES	CORN	CORN	NT	WHEAT
Ed Thill 6	2.2	1	3	1	1	0.4	1.2	YES	NO	YES	CORN	CORN	NT	NONE
Home 1+2	34.5	4	5	2	4	1.8	3	YES	YES	YES	ALF/GRASS CLOVER	CORN	NT	HAY
Home 5+6	30	4	6	3	4	1.8	2.8	YES	YES	YES	CORN	CORN	NT	WHEAT
Home 7	10	3	6	3	4	1.3	2	YES	YES	YES	CORN	CORN	NT	WHEAT
Home 8	2.6	1	2	1	1	0.4	1.1	YES	NO	YES	CORN	CORN	NT	NONE
In Town	8.5	1	4	1	2	0.9	2.4	YES	YES	YES	CORN	CORN	NT	WHEAT
R. Eibs	16	4	6	3	3	1.4	1.9	YES	NO	YES	NP	CORN	NT	RYE
Ware 1	40	1	6	1	4	0.9	3	YES	YES	YES	CORN	CORN	NT	RYE
Ware 2	10	2	3	2	2	2.6	2.8	YES	NO	YES	CORN	CORN	NT	RYE
Ware 3	25	2	6	2	3	1.6	2.7	YES	YES	YES	CORN	CORN	NT	RYE

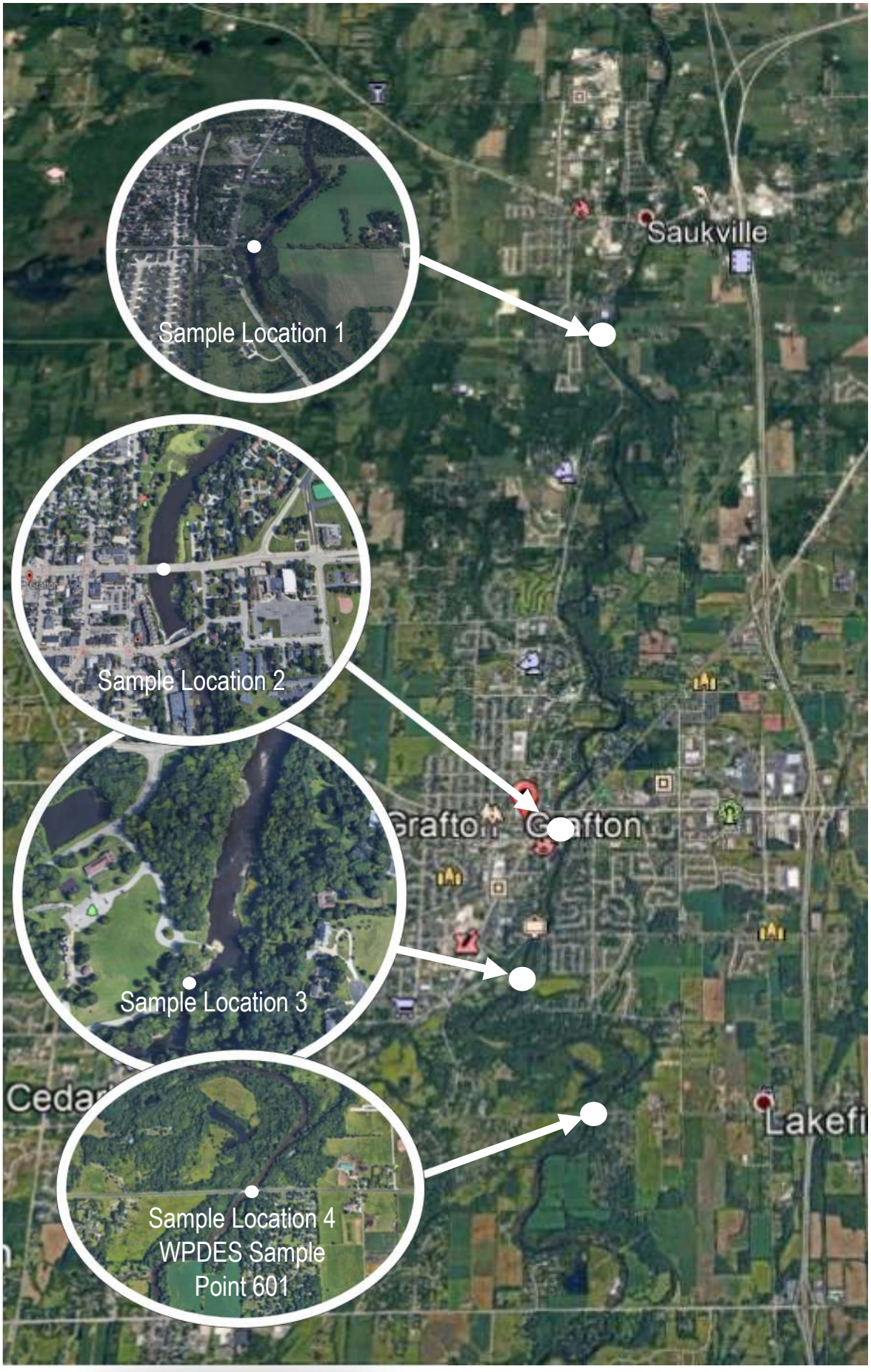
359.6 ACRES

TRIANGLE ACRES	ACRES	20% LIVING / 50% TOTAL COVER BY OCTOBER 15	20% LIVING/ 50% TOTAL COVER THROUGH APRIL 15	20% LVING /50% TOTAL COVER THROUGH JUNE	MANURE?	QUALIFIED?	QUALIFIED INCENTIVES	TOTAL INCENTIVE PAYMENT FOR FIELD	TOTAL P REDUCTION	HARD PRACTICE POTENTIAL	NOTES:
Ansay 1	18.2	N	Y	N	N	1	$10	$182	36.4		
Ansay 2	8	Y	Y	N	N	1	$20	$160	16.0		
Ansay 3	28.3	Y	Y	N	N	1	$20	$566	28.3		
Dimmer	52	N	N	Y	N	1	$10	$520	104.0		
Ed Thill 1	26.5	Y	Y	Y	N	1	$30	$795	0.0		
Ed Thill 2	18.3	N	N	N	Y	0	$0	$0	54.9		
Ed Thill 3-4	23.3	N	N	N	Y	0	$0	$0	69.9		
Ed Thill 5	6.2	N	Y	N	Y	0	$0	$0	18.6		
Ed Thill 6	2.2	N	N	N	Y	0	$0	$0	4.4		
Home 1+2	34.5	Y	N	Y	Y	0	$0	$0	34.5		
Home 5+6	30	Y	Y	Y	Y	0	$0	$0	60.0		
Home 7	10	Y	Y	N	Y	0	$0	$0	30.0		
Home 8	2.6	N	N	N	Y	0	$0	$0	2.6		
In Town	8.5	N	Y	N	N	1	$10	$85	25.5		
R. Eibs	16	Y	Y	N	N	1	$20	$320	32.0		
Ware 1	40	N	Y	N	N	1	$10	$400	200.0		
Ware 2	10	N	Y	Y	N	1	$20	$200	10.0		
Ware 3	25	N	Y	Y	N	1	$20	$500	100.0		
	359.6						**TOTAL**	**$3,728**	**827**	**LBS**	

Appendix B
River Monitoring Data and Analysis

Appendix B1
River Sampling Location Map

River Sampling Location Map



Appendix B2

Sample Data and Analysis for 2025 Growing Season

Data Summary - Growing Season 2025

Total Phosphorus Concentration

Growing Season (May - October)

Date	Location 1	2	3	4
May	0.03	0.03	0.05	0.051
June	0.081	0.066	0.108	0.132
July	0.200	0.170	0.171	0.157
August	0.248	0.228	0.239	0.236
September	0.192	0.194	0.196	0.178
October	0.003	0.008	0.004	0.014
Median	0.137	0.118	0.140	0.145
Water Quality Standard	0.075	0.075	0.075	0.075
Max value	0.248	0.228	0.239	0.236
Min value	0.003	0.008	0.004	0.014
Midpoint	0.1255	0.118	0.1215	0.125
Lower Confidence Limit (80%)	0.076	0.062	0.085	0.095
Upper Confidence Limit (80%)	0.197	0.174	0.194	0.194

Filtered Total Phosphorus Concentration

Growing Season (May - October)

Date	Location 1	2	3	4
May	0.019	0.033	0.033	0.026
June	0.058	0.058	0.094	0.087
July	0.170	0.167	0.157	0.152
August	0.166	0.192	0.175	0.181
September	0.183	0.186	0.163	0.167
October	0.001	0.000	0.007	0.017
Median	0.112	0.113	0.126	0.120

Appendix B3

Sample Data and Analysis 2022-2025 Growing Season

Data Analysis 2022 thru 2025 Growing Seasons

		Total Phosphorus (mg/L)			
	Sample	Location			
	Collection Date	1	2	3	4
2022	May	0.081	0.087	0.093	0.083
	June	0.102	0.115	0.109	0.102
	July	0.1	0.097	0.084	0.072
	August	0.111	0.095	0.095	0.083
	September	0.065	0.072	0.086	0.072
	October	0.011	0.014	0.03	0.022
2023	May	0.061	0.081	0.062	0.066
	June	0.211	0.164	0.148	0.159
	July	0.064	0.088	0.07	0.069
	August	0.488	0.103	0.14	0.121
	September	0.08	0.062	0.124	0.057
	October	0.199	0.062	0.048	0.077
2024	May	0.146	0.153	0.014	0.015
	June	0.153	0.153	0.163	0.166
	July	0.229	0.194	0.237	0.208
	August	0.226	0.21	0.225	0.225
	September	0.103	0.117	0.162	0.099
	October	0.072	0.096	0.097	0.073
2025	May	0.030	0.030	0.050	0.051
	June	0.081	0.066	0.108	0.132
	July	0.200	0.170	0.171	0.157
	August	0.248	0.228	0.239	0.236
	September	0.192	0.194	0.196	0.178
	October	0.003	0.008	0.004	0.014
	Median	0.103	0.097	0.103	0.083

Appendix B4

Figure 1: Total Phosphorus in the Milwaukee River Growing Season 2025

Figure 1: Total Phosphorus in the Milwaukee River Growing Season 2025